



AGENDA

WATER RESOURCES ADVISORY COMMISSION

Thursday, July 5, 2007, 9:00 AM

District Headquarters - B-1 Auditorium

3301 Gun Club Road

West Palm Beach, FL 33406

1. **Welcome and Introductions** - Michael Collins, Chair
2. Member Issues 30m
3. Old Business: Everglades National Park General Management Plan Alternatives and Alternative E.
Mike Collins, Chair 15p 15d
See supporting document: [WRAC Rec Iss Wrksh EEvgs recs 6 28 07.pdf](#)
See supporting document: [WRAC Rec Alt E ENP GMP 6-28-07.pdf](#)
 - Public Comment 10m
4. Year-round Landscape Irrigation Measures Rule Development - Keith Smith, Dep. Director, Water Supply Dept., SFWMD 10p 10d
 - Public Comment 10m
5. Final Consumptive Use Permitting (CUP) Rulemaking Language for the Central Florida Coordination Area (CFCA) - Keith Smith, Dep. Director, Water Supply Dept., SFWMD 10p 10d
6. Proposed Rule Development: Lake Okeechobee Service Area Water Supply, and Establishment of Water Reservation for Indian River Lagoon Project Implementation Report - Chip Merriam, Deputy Executive Director, Water Resources, SFWMD 10p 10d
7. Fiscal Year 2008 (FY08) Alternative Water Supply (AWS) Program - Mark Elsner, Director, Water Supply Implementation Division, SFWMD 5p 10d
8. Northern Everglades Initiative Update - Temperince Morgan, Lead Technical Program Specialist, Northern Everglades, SFWMD 10p 15d
See supporting document: [TM NEEPA-update-WRAC-7-5-07fin.pdf](#)
9. Working Lunch - 12:00 - 12:45 p.m. 45m

- 10.** Understanding Herbert Hoover Dike Rehabilitation and Spillway, Alternative Plan Six and Everglades Agricultural Area Storage:
- a. Dennis Duke, Ecosystem Restoration Director, U.S. Army Corps of Engineers (USACE)
 - b. Tommy Strowd, Assistant Deputy Director, Everglades Restoration, SFWMD
 - c. Richard Punnett, Ph.D., Principal Hydrologic Modeler, USACE
- 45p 30d
- See supporting document: [10 County Coalition Regional Storage 6-7-07 TBS-REP.pdf](#)
- Public Comment 15m
- 11.** Clarifying State Assurances for Accelerate Projects - Ken Ammon, Deputy Executive Director, Everglades Restoration, SFWMD 15p 15d
- 12.** Lake Okeechobee Committee Report - Malcolm "Bubba" Wade, Chair 10p 10d
- 13.** Melaleuca and Other Exotic Plant Eradication - Biological Controls Project Update - Shauna Allen, Project Manager, U.S. Army Corps of Engineers (USACE); and John Morgan, Project Manager, Everglades Restoration, SFWMD 10p 10d
- See supporting document: [MelBioControlTSP_Brief.pdf](#)
- Public Comment 15m
- 14.** Adjourn: 3:45 p.m

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2. Member Issues

30m

3. Old Business: Everglades National Park General Management Plan Alternatives and Alternative E.

Mike Collins, Chair

15p 15d

See supporting document: [WRAC Rec Iss Wrksh EEvg recs 6 28 07.pdf](#)

See supporting document: [WRAC Rec Alt E ENP GMP 6-28-07.pdf](#)

- Public Comment

10m

Recommendation of WRAC Recreation Issues Workshop, June 28, 2007 Re:
East Everglades Expansion Area

WILDERNESS DESIGNATION

- Wilderness designation should be precluded
- Night lights visible from adjacent urban areas (Miami, Kendall, Homestead, Florida City, including the Miccosukee Hotel and Casino and automobiles traveling Tamiami Trail)
- Sound from highway traffic; commercial and private aviation over flights; and agricultural pumps and farm equipment.
- Impacts to the resource from prior agricultural activities
- The need for mechanized access for assertive wildlife and ecosystem management (wildfire suppression, prescribed burns, protected species monitoring and management, exotic flora and fauna eradication.)
- Expansion Area should serve as a natural buffer area between the Park's Wilderness and developed areas.

PRIMITIVE BACKCOUNTRY DESIGNATION

- Should be precluded for applicable reasons listed above
- If implemented, accommodations must be made for reasonable exercise of legislatively authorized commercial and private airboat activities.

COMMERCIAL AIRBOAT OPERATIONS

- Commercial airboat operations must be preserved.
- Commercial airboat rides are an important cultural icon that is part of Miami's identity, featured on commercials and television shows and publications.
- Travel information throughout the world promote the airboat rides as a tourist destination. Thousands of visitors from all over the world come to see and appreciate the Everglades via these rides.
- The rides provide an enjoyable opportunity to expand public knowledge of the Everglades ecosystem, and to expand advocacy for healthy natural resources.
- Coopertown reportedly qualifies for historical listing.

PRIVATE AIRBOATING

- The Expansion Act provides for the grandfathering of airboaters (on designated routes) who used the area prior to the enabling legislation.
- As the NPS failed to document individuals who qualify for grandfathering, we recommend that all applicants must have been at least 16 years old (the average age for the cultural rite of passage for airboaters to operate

- independently) on the stipulated date. The need for specialized boats for the habitat and prohibition of hunting or frogging will limit the applicants.
- Request designated routes leading to areas of significance to the Gladesman culture, in consultation with area airboaters.
 - Request a designated public boat ramp for permitted airboaters and paddle boats at Tamiami Trail.
 - Request a designated public boat ramp on the eastern boundary, south of Chekika.
 - Request authorized private access from the Airboat Association of Florida property.
 - Request ingress and egress route from the Airboat Association of Florida property to any future bridge, the elevation of which is sufficient for vessel passage to Tamiami Trail and/or the Water Conservation Areas.



**SOUTH FLORIDA WATER MANAGEMENT DISTRICT
WATER RESOURCES ADVISORY COMMISSION (WRAC)**

Recreation Issues Workshop
Thursday, June 28, 2007, 5:00 – 8:00 p.m.
District Headquarters - B-1 Auditorium
3301 Gun Club Road
West Palm Beach, FL 33406

**Everglades National Park (ENP)
General Management Plan (GMP)
Recommendations**

Based on

ALTERNATIVE E

"Everglades for the Educated"

A Position Paper on the GMP Preliminary Alternatives

Prepared by leaders/members of the Don Hawley Foundation, Florida Keys Fishing Guides Association, Bonefish & Tarpon Unlimited, Reef Rod and Gun Club, Islamorada Fishing Club, and Islamorada Fishing and Conservation Trust Focused on Florida Bay and the Keys, Royal Palm to Flamingo, and the Gulf Coast

**As edited by general consensus of WRAC Recreation Issues Workshop
participants on June 28, 2007.**

“Everglades for the Educated”
Our Objectives

- To provide a higher quality, land based, boating, paddling and camping experience to park visitors.
- To provide more **protection of seagrasses**.
- To designate ENP into several new, well defined management zones.
- To provide faster response protection to nesting/fledging sites for important bird species such as the roseate spoonbill if deemed critical.
- To provide a wider range of camp sites and chickees for a more diverse set of park visitors that does not preclude elderly and mobility impaired from seeing remote areas of the park.
- To provide more compliance to park regulations with less enforcement, we feel attracting and retaining long-term, experienced Rangers will be challenged by affordable housing, cost of living in S. Florida, Ranger salary ranges, and the discomfort of working the Everglades during the summer.
- To prepare for a population in S. Florida that will continue to grow. However, past visitor numbers do not prove an increase in visitors is occurring and visitation numbers are actually down to flat.
- To provide improved safety for resources, visitors and staff.
- To “trade off “no or few signs of human presence with more educational signage and markers allowing safe and harmless access to frequently visited areas would be acceptable.
- **To educate users about etiquette, navigation, current regulations and wildlife in the Park with confidence that 98%+ will comply if they are educated.**
- **To not harm our local economy, customs, traditions and values, and to value input from the professional guides, their clients from around the nation, and avid recreational anglers in the Keys, Homestead and South Florida that have been the leading change agents and stewards of the Everglades National Park for over three decades.**

Executive Summary

Alternative E focuses on Education & Compliance, Resource Protection, Access and Visitor Experience. We do not support Alternative A, B, C or D. We support and recommend Alternative E. While some new concepts shared but not well defined in the preliminary alternatives such as “management by water depth” zones have merit, our Alternative E will bring clarity and specificity to the proposed new zoning terminology. Furthermore Alternative E is financially realistic or at least approachable, especially with more focus on public/private financial support, and park management reprioritizing budget allocations. More specifically:

1. Supports a mandatory boater education permit in order to operate a vessel in the Park and significantly more focus on educating all visitors on the water.
2. Better protection for seagrass and nesting/fledging birds.
3. Does not further limit fishing opportunities to responsible/educated users of motorized vessels, therefore no negative impact to local economies and no negative impact to areas that would receive more pressure through the closures/restricted access suggestions in alternatives B, C, and D.
4. Supports designation of Backcountry Zones (the old no-motor zones) to Joe and Little Madeira along with better experiences for paddlers in current no motor zones. We do not support adding any additional no-motor or now called “backcountry zones” within ENP.
5. Supports more attention to teaching etiquette and other courtesies that need to be practiced by various visitors in the park.
6. Supports the concept of “Management by Water Depth Zones” but changes the definition to waters less than 2’ to only poling, paddling or using electric trolling motors in very specific areas. The zones must also allow motor vessel ingress and egress in all water 2’ or greater in depth, and allow a motor on the transom of vessels in the zone as long as it is trimmed up and not in use. We do not support the concept in any location except Snake Bight and Keys in front of Flamingo surrounded by water less than 2’ deep as indicated on NOAA charts.
7. Supports the implementation of a guideline requiring courteous operation when within the vicinity of paddlers and anchored vessels.
8. Promotes significantly increasing and maintaining gated makers throughout the park. GPS only get visitors to the vicinity of marked routes and do not tell them exactly where to run in routes marked on charts.
9. Supports low cost, high impact visitor experiences between Royal Palm and Flamingo.
10. Encourages outside partnerships and public sponsors.

Recommendations “Everglades for the Educated”

EDUCATION AND COMPLIANCE

- We enthusiastically embrace a mandatory boater certification permitting program. This would require all vessel operators in the Park to complete an online or traditional classroom study program and to pass a test to legally utilize park waters.
- We request a dramatic increase in focus on **education**. We must have ongoing focus on seminars and effective collaterals centered on user group etiquette, signage, park regulations, markers, navigation, wildlife, resource protection, the importance of catch and release, fish handling procedures, nesting facts, park history, and more.
- We value much **stiffer penalties** for people who repeatedly violate the park resources and regulations. To include mandatory education classes which the time to attend hurts much more than a trivial fine to as much as banning users from the Park for repeated and serious violations.
- We support significantly increasing signage, buoys, and markers to guide, educate and warn users of **safety to self and resources**. This will not take away from the visitor experience, however; it will have a major impact on resource protection, safety, and quality of experience for all visitors.
- We urge courteous operation throughout the Park which will improve fishing and paddling visitor experiences.

RESOURCE PROTECTION

- We do not support limiting boat size or motor horse power in the Park, but we do recommend a “Park Recommended Travel Corridor Chart” indicating trouble areas and preferred routes by vessel size/draft.
- We support designating Keys in ENP as a Wildlife Habitat Protection Zone (WLPZ) as long as the definition remains as it is now: Except to effect a rescue, or unless otherwise officially authorized, no person shall land on keys of the Everglades except those marked by signs denoting the area is open to the public, and on a critical case by case basis, “seasonally” establishing a buffer area to keep visitors from spooking important species birds off their nests. We could never support the definition of a WLPZ provided by a NPS biologist at a public workshop – that being a 500’ buffer would exist around each Key. Any future plan presented should include very specific language and detailed charts or aerial maps depicting extents of Zones and conditions which would trigger partial or full closures.
- We support the zoning concept of “Management by Water Depth” zones allowing only “paddling, poling or use of electric trolling motors” in very critical strategic locations. **Those locations should be carefully chosen based on physical evidence showing significant resource damage under current conditions. Park Staff should work closely with stakeholders to develop detailed charts showing proposed Pole and Troll zones prior to plan selection. Boats operating in these water depth designations may have an engine attached but it shall be trimmed up and not in use.**

Language should be added to any newly restricted area exempting the restrictions and permitting safe operation of vessels when weather and/or sea conditions necessitate seeking of safe harbor.

- We specifically recommend better located and maintained GATED markers for travel routes and points, to include Nine Mile Bank and other western portions of the park, as well as preferred travel corridors from Islamorada, Key Largo, and the Gulf through the park. This will reduce groundings, seagrass damage and help improve visitor experiences.

ACCESS

- We oppose eliminating access to any waters currently available to motorized vessels. The new backcountry zones marked in Alternative B that incorporates Hells Bay, parts of Tarpon Bay and the waters north of the Wilderness Water Way near Chokoloskee are unacceptable.
- We support reopening Joe and Little Madeira Bay as no-motor "Backcountry" zones. This assumes current no-motor zones and Joe/Little Madeira would now be called Backcountry Zones and would continue to be used only by *vessels with no motor or vessels in which the motor(s) is (are) removed from the gunnels or transom and are stored to be inoperable.*
- We support more focus on keeping motorized skiffs out of Backcountry Zones via education, stiffer penalties, and where practical, barriers at entrances.
- We wish for the establishment and marking of an Alternate Wilderness Waterway for paddlers. But motor vessels that have no other route to reach their destinations (such as the Rookery Branch or Rogers Creek), or where it overlaps the current wilderness waterway must be allowed access at safe speeds. Also, keep in mind that disoriented and distressed paddlers often need and seek help from motorized vessel users.
- We oppose prohibiting motor vessel users from camping and fishing experiences in Hells Bay, Lane Bay, North River and Tarpon Bay for example. Joe/Little Madeira Bay should be newly designated as Backcountry Zones. No additional waters new waters should be designated under the new "back country" zone.

VISITOR EXPERIENCE

- We support better maintenance of existing camp sites.
- We support building new camp sites when ENP budget or public funding/contributions become available. Priority being new campsites in the old no-motor zones and Joe/Little Madeira Bay, because over a half day's travel by paddle to or in no motor/paddle only zones is pointless.
- We suggest establishing a guideline that requires courteous operation of all vessels when within the vicinity of paddled vessels or anchored/staked up vessels.

- We support increased activities for land based visitors between Royal Palm and Flamingo during peak visitor times.
 - Dedicated bike path with more land based fishing opportunities and more paddle launch areas also provided between Coe Center and Flamingo
 - Regular and expanded programs to include Nike missile site
 - Bus service with stops and for interpretations along the route

Regional Economy

- Since the new General Management Plan has the potential to greatly influence the regional economy and in light of several federal regulations that require consideration of those impacts on agency actions we urge a complete Social / Economic / Cultural study be implemented. This Study must identify existing activities on the area and how they will be impacted by any proposed new regulations.

4. Year-round Landscape Irrigation Measures Rule Development - Keith Smith,
Dep. Director, Water Supply Dept., SFWMD 10p 10d
- Public Comment 10m

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8. Northern Everglades Initiative Update - Temperince Morgan, Lead Technical Program Specialist, Northern Everglades, SFWMD 10p 15d

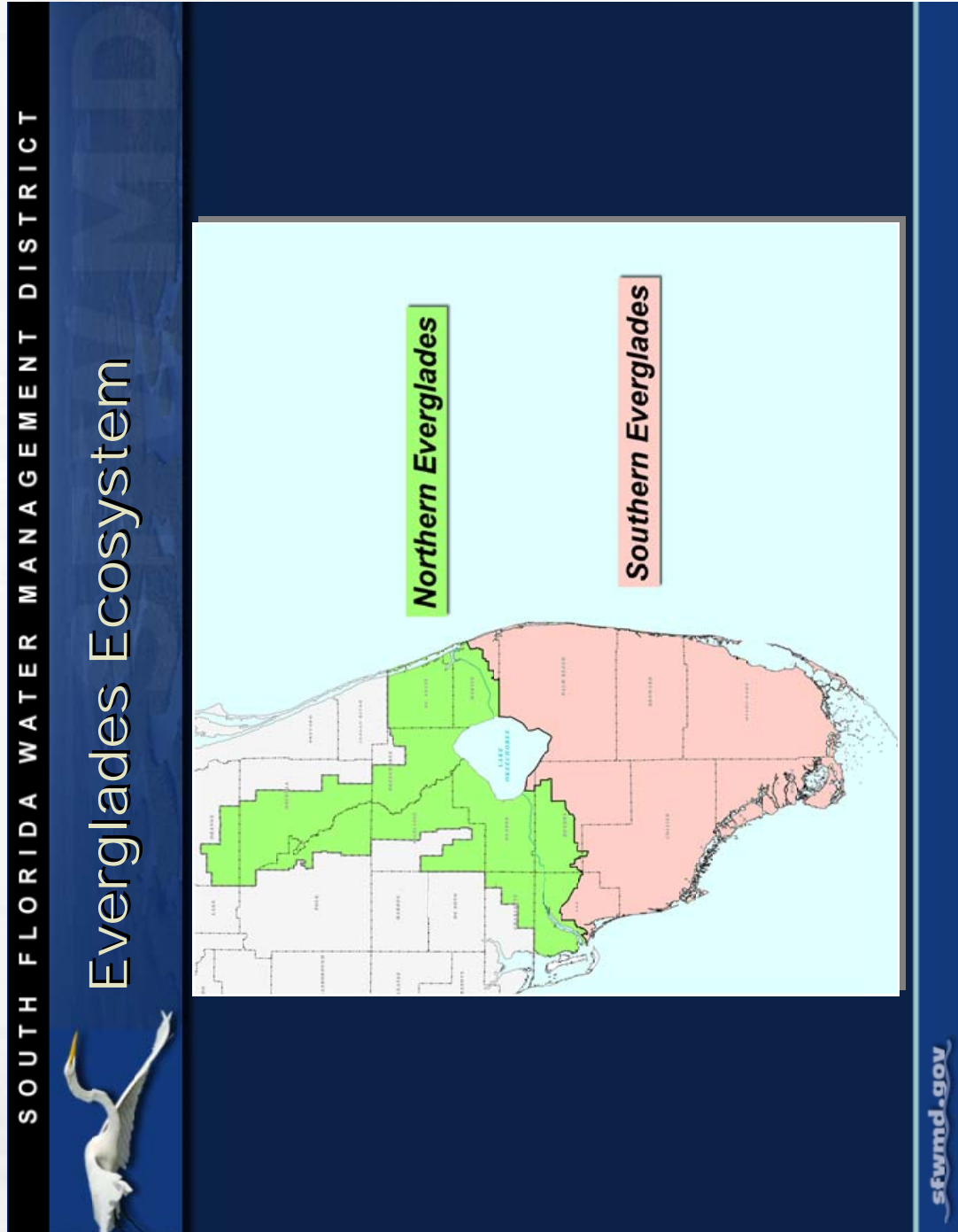
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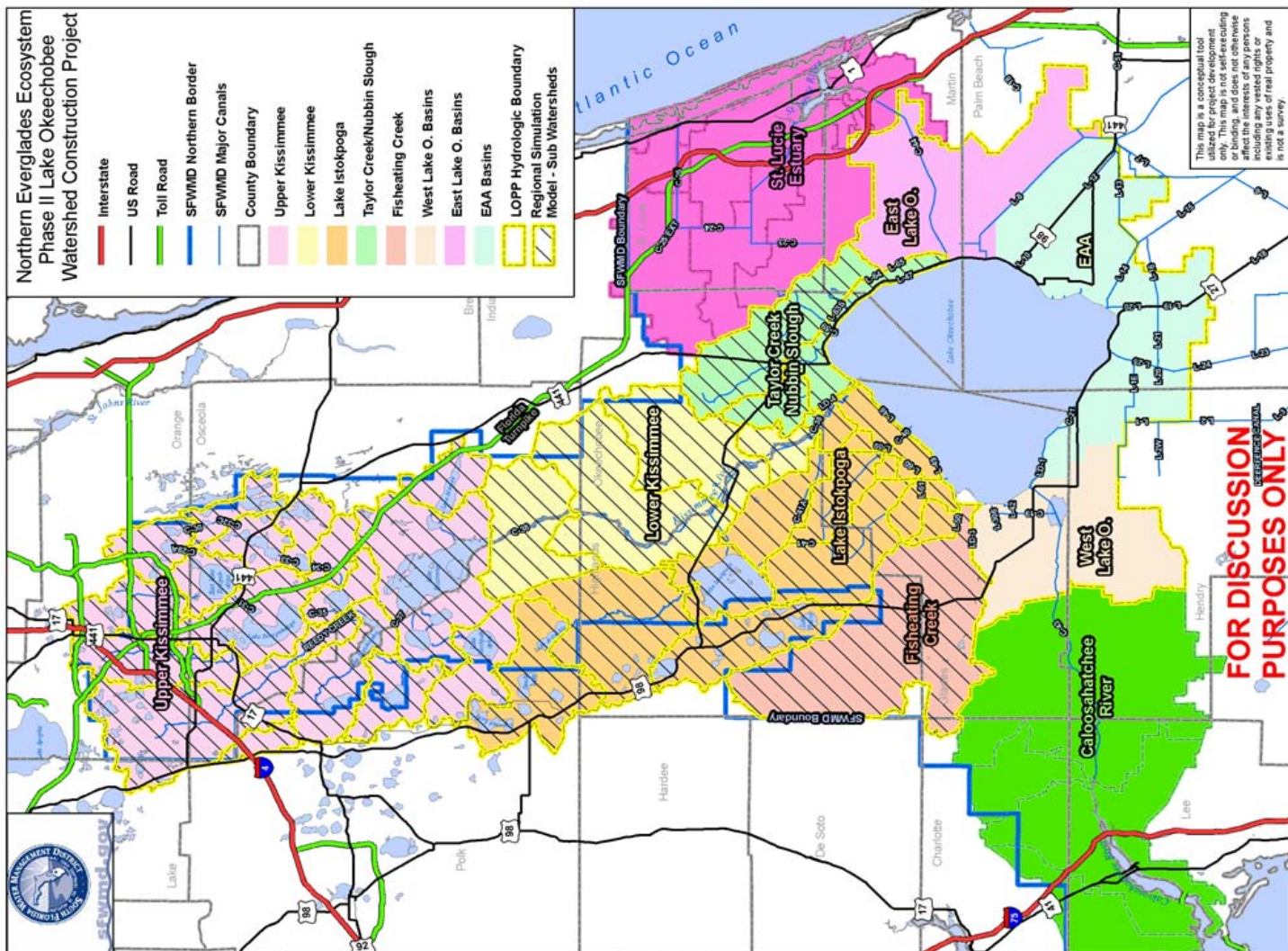


Northern Everglades Initiative Update Temperince Morgan, Lead Technical Program Specialist

Water Resources Advisory Commission
July 5, 2007

Everglades Ecosystem





Phase II Technical Plan Lake Okeechobee Watershed

Problems

- Undesirable high levels in Lake Okeechobee
- Undesirable low levels in Lake Okeechobee
- Excess regulatory discharges to the Caloosahatchee Estuary
- Undesirable low flows to the Caloosahatchee Estuary
- Excess regulatory discharges to the St. Lucie Estuary
- Excessive phosphorus loads to Lake Okeechobee
- Limited operating flexibility for lakes stage management
- Upper Floridan – groundwater water supply limitations in Upper Kissimmee Basin

Phase II Technical Plan Lake Okeechobee Watershed

Objectives

- **Meet Lake Okeechobee Watershed Total Maximum Daily Loads**
- **Manage Lake Okeechobee levels within an ecologically desirable range**
- **Manage flows to meet desirable salinity ranges for the St. Lucie and Caloosahatchee Estuaries**
- **Identify opportunities for alternative surface water supply sources in the watershed**

Phase II Technical Plan Lake Okeechobee Watershed

Constraints

- **Provide Kissimmee River restoration flows**
- **Avoid precluding Everglades restoration flows**
- **Maintain water supply for affected water user basins**
- **Herbert Hoover Dike limitations**
- **Maintain existing levels of flood protection**
- **Minimum flows and levels- Lake Okeechobee, St. Lucie Estuary, Caloosahatchee Estuary, Lake Istokpoga**
- **Water quality standards**

Phase II Technical Plan Lake Okeechobee Watershed

Management Measures

■ Definition

- A management measure is a feature or activity that can be implemented at a specific site to address one or more planning objectives.
- A feature is defined as a structural element that requires construction or assembly on-site.
- An activity is defined as a non-structural action or a practice that is implemented to achieve one or more project goals.

Phase II Technical Plan Lake Okeechobee Watershed


Management Measures

- **Currently compiling and sorting measures by levels**
- **Levels of management measures**
 - **Level 1- Already constructed/implemented or construction/implementation imminent**
 - **Level 2- Construction/implementation likely; Detailed design/activity development ongoing; Location well defined**
 - **Level 3- Implementation certainty unknown; Conceptual level of design/activity development complete; Location defined**
 - **Level 4- Implementation certainty unknown- Conceptual idea; May have rough order of magnitude cost and/or general basin location**
 - **Level 5- Implementation certainty unknown-Conceptual idea with limited information**

Phase II Technical Plan Lake Okeechobee Watershed

Schedule

- **Assemble Baseline Information
and Alternative Formulation** Summer 2007
- **Draft Plan** October 2007
- **Final Plan to Governing Board** January 2008
- **Submit Plan to Legislature** February 1 2008



Questions

9. Working Lunch - 12:00 - 12:45 p.m.

45m

10. Understanding Herbert Hoover Dike Rehabilitation and Spillway, Alternative Plan Six and Everglades Agricultural Area Storage:
- a. Dennis Duke, Ecosystem Restoration Director, U.S. Army Corps of Engineers (USACE)
 - b. Tommy Strowd, Assistant Deputy Director, Everglades Restoration, SFWMD
 - c. Richard Punnett, Ph.D., Principal Hydrologic Modeler, USACE

45p 30d

See supporting document: [10 County Coalition Regional Storage 6-7-07 TBS-REP.pdf](#)

- Public Comment

15m



Regional Storage / Treatment & Conveyance Issues

Tommy B. Strowd, P.E., South Florida Water Management District
Richard Punnett, PhD., P.E. Engineering Consultant

10-County Coalition Meeting
June 7, 2007



Regional Ecosystem Restoration Components

- Surface Water Reservoirs
- Stormwater Treatment Areas (STAs)
- Canal widening
- Aquifer Storage & Recovery (ASR) Wells

Regional Ecosystem Restoration Components

- Everglades Agricultural Area (EAA) Flowway
 - Originally suggested in 1993
 - Evaluated as an alternative in the Comprehensive Everglades Restoration Plan (CERP) and rejected
 - Recent concerns over regional water resource policy have revived the discussion of its potential utilization in restoration



Regional Concerns

- Lake & Estuary environmental impacts in wet years
 - High Lake Okeechobee stage
 - Impacts to littoral zone
 - Threat to Herbert Hoover Dike
 - High discharge to estuaries
 - High Water Conservation Area (WCA) stages
- Environmental & water supply problems in dry years
 - Lake Okeechobee low stages (Water Supply & Minimum Flows & Levels)
 - Everglades low stages & flows
 - Stormwater Treatment Area water needs
 - East & West Coast utilities
 - Estuary minimum flows & levels



Regional Concerns

- Uncertainty of ASR effectiveness
 - Floridan Aquifer storage / retrieval capacity
 - Water quality concerns
- Climatology
 - Atlantic Multi-Decadal Oscillation (AMO)
 - May result in increased wet season rainfall over an extended period

A Review of the Flowway Concept

1. Brief History of Reports
2. Flowway Evaluations

Dr. Richard Punnett



Comprehensive Review of Central and Southern Florida (C&SF) Project

- Evaluated Flowways in a Two Phase Study:
 - Reconnaissance Phase – Report in 1994
 - Feasibility Phase – Report in 1999.
 - Now known as CERP.

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Agenda of the South Florida Water Management District – July 5, 2007

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- 48
- Agenda of the South Florida Water Management District – July 5, 2007



Recon Report: Flowway Pro's

- The alternative plans that enhance sheet flow would result in an improvement in nutrient spreading and uptake would be expected.
- In WCA-3A, there was improvement in dry times, but less than the improvement in some other alternatives.



Recon Report: Flowway Con's

- Was not the most effective plan
- Flowway water fluctuation was not like a wetland
- Flood crests in the WCA-3A still too high
- Flows to the Everglades National Park (ENP) remained too low
- Had very low habitat suitability

1999 Feasibility Report

“The Restudy”

- Evaluation of the flowway concept shows several erroneous assumptions about the flowway feasibility:
 - Soil subsidence
 - Evapotranspiration (ET)
 - Seepage management
 - Vegetation
 - Timing of flows
 - Lack of flow events are evident
- Flowways would exacerbate the already high stages in the northern parts of the WCAs.



1999 Feasibility Report, Continued

- “Summarizing, the flowway is a concept that creates a water supply burden on the system without clear hydrologic benefits.”



Flowway Management Dilemmas

- Water deliveries to or from a flowway will never be natural because Lake Okeechobee has changed
- Mutually exclusive goals:
 - spatial extent (e.g. sawgrass community or marsh)
 - natural deliveries to the WCAs and ENP?

Other Everglades Restoration Reports

- Science Sub-Group Report, 1996
- Governor's Commission for Sustainable South Florida Conceptual Plan, 1996
- Department of Interior (DOI) Science Plan, 2005

None of the reports mentioned the flowway.

All reports discussed the need for managed storage.



Why is managed storage important?

- Improve Lake Okeechobee levels
- Improve estuary flow levels
- More natural flows into WCAs and ENP

Does storage location matter?

- Catch water where it is in excess
- The more upstream storage is in the system, the more downstream needs it can meet.

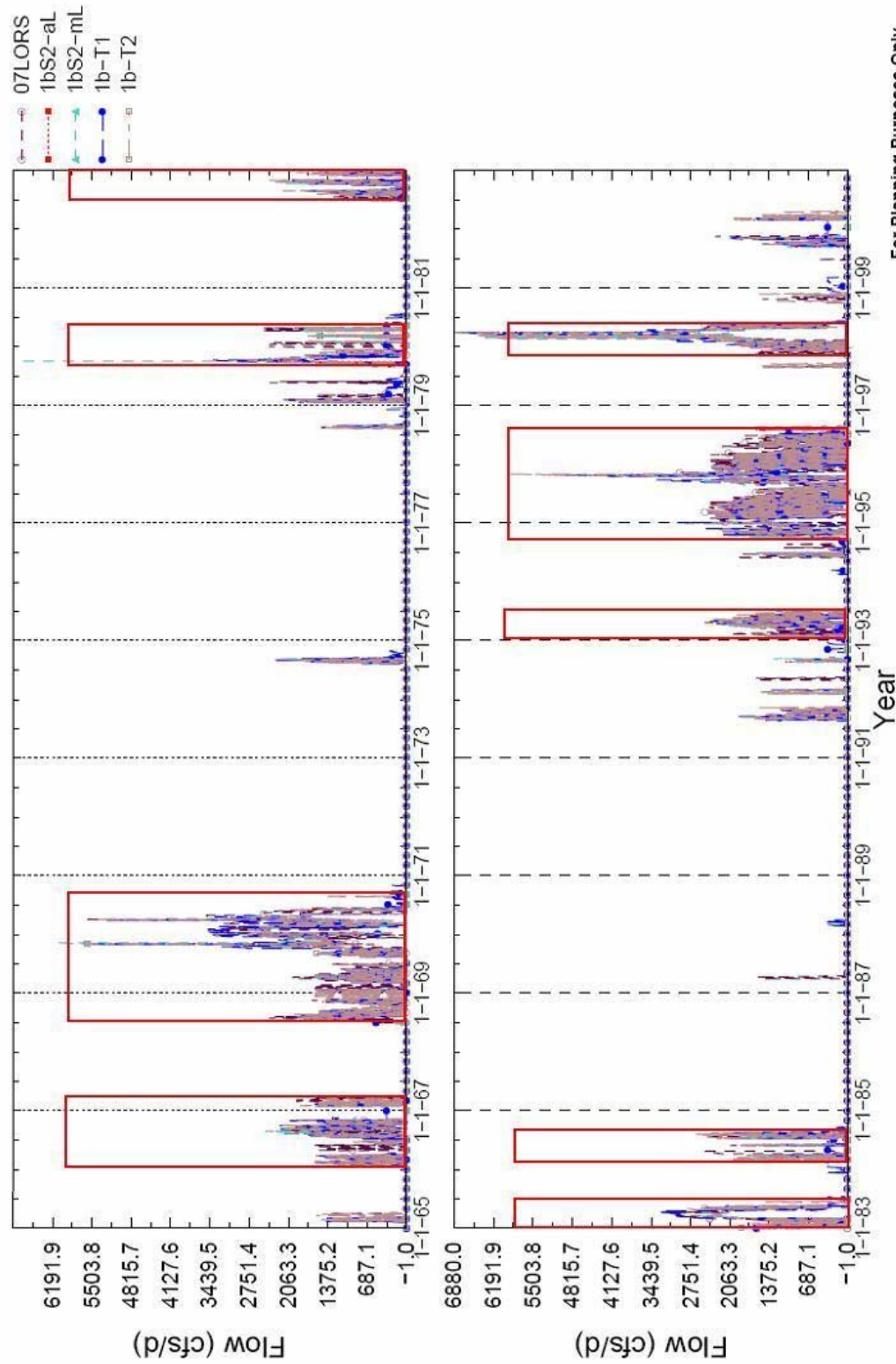


Water Availability Issues

- Both high water and low flow issues were identified in both the Recon and Feasibility Reports as problems for the flowway concept.
- Would a newer, lower lake schedule, such as the Lake Okeechobee Regulation Schedule Study (LORSS):
 - Fix the high regulatory discharges issues?
 - Make more water available for the flowway?

Flood Discharges from Lake Okeechobee For LORSS

S308 Regulatory Discharges to St. Lucie Estuary

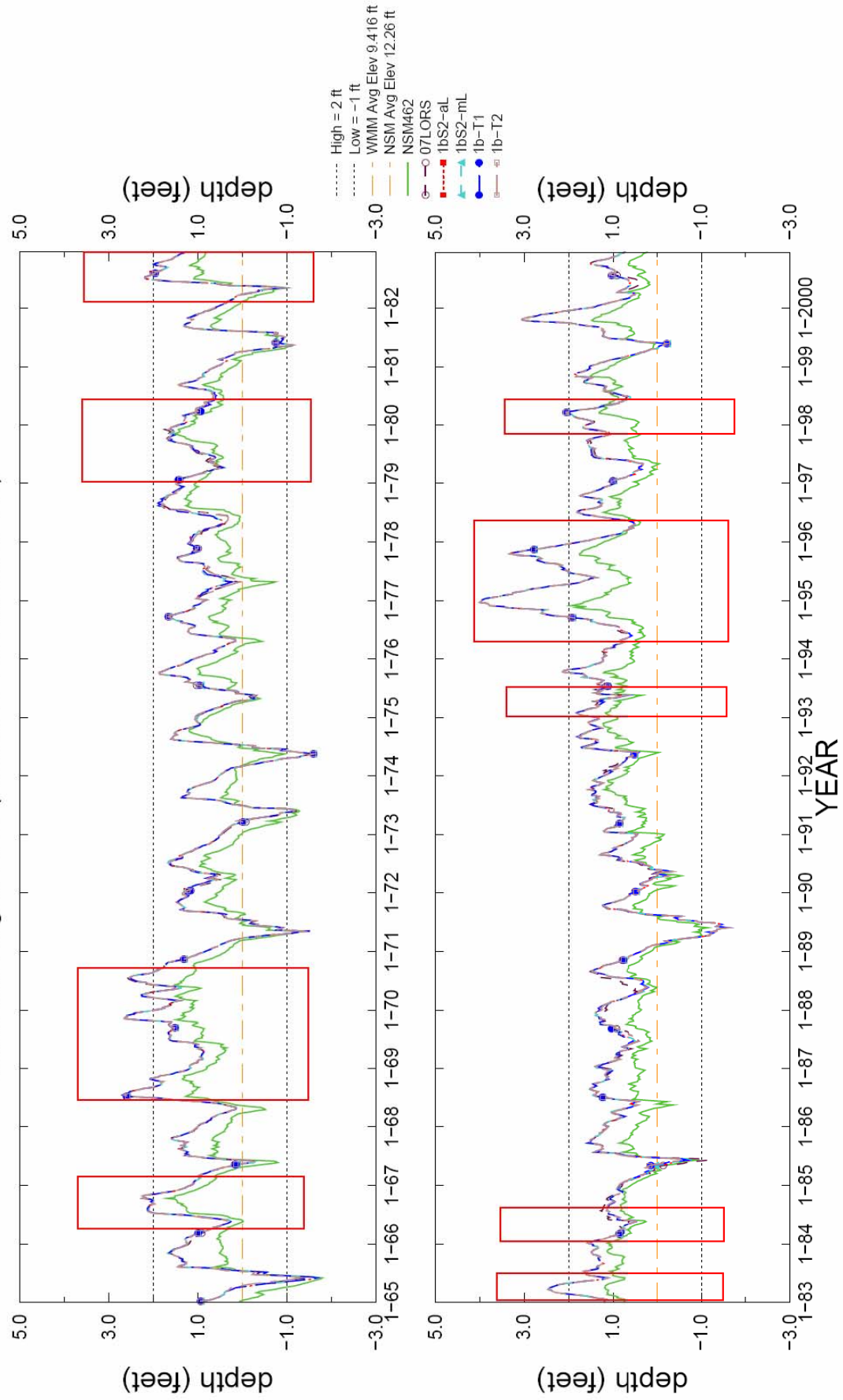


SFWMM P.O.S. 1965 - 2000

High stages in Lake Okeechobee <--> high stages in WCA-3A For LORSS

Normalized Weekly Stage Hydrograph for WCA-3A NE

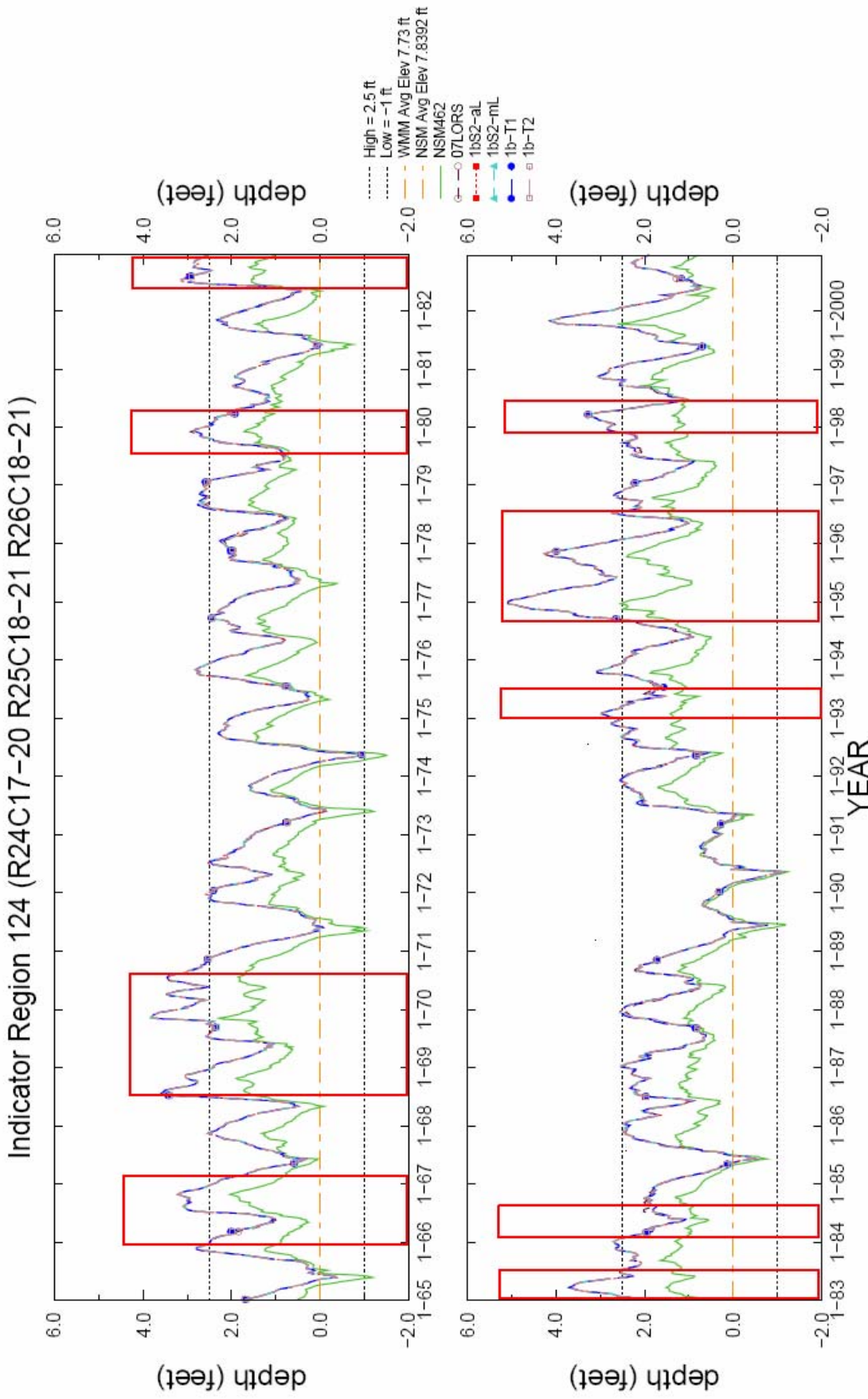
Indicator Region 116 (R39C22-25 R40C25-25)



Restudy concluded that a flowway would exacerbate high stages in northern parts of WCAs.

High stages in Lake Okeechobee <--> high stages in WCA-3A For LORSS

Normalized Weekly Stage Hydrograph for WCA-3A South

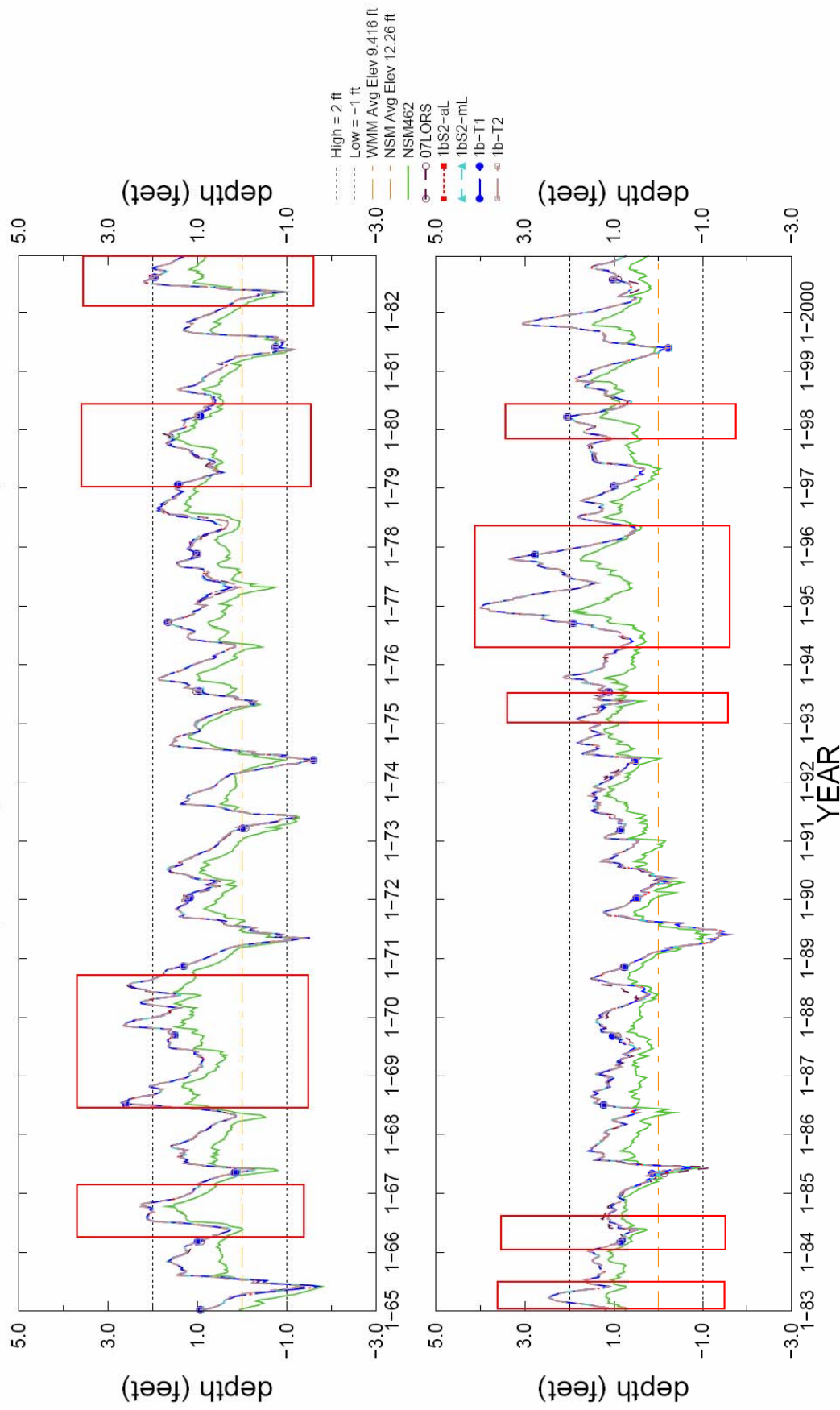


Restudy concluded that a flowway would exacerbate high stages in northern parts of WCAs.

High stages in Lake Okeechobee <--> high stages in WCA-3A For CSOP

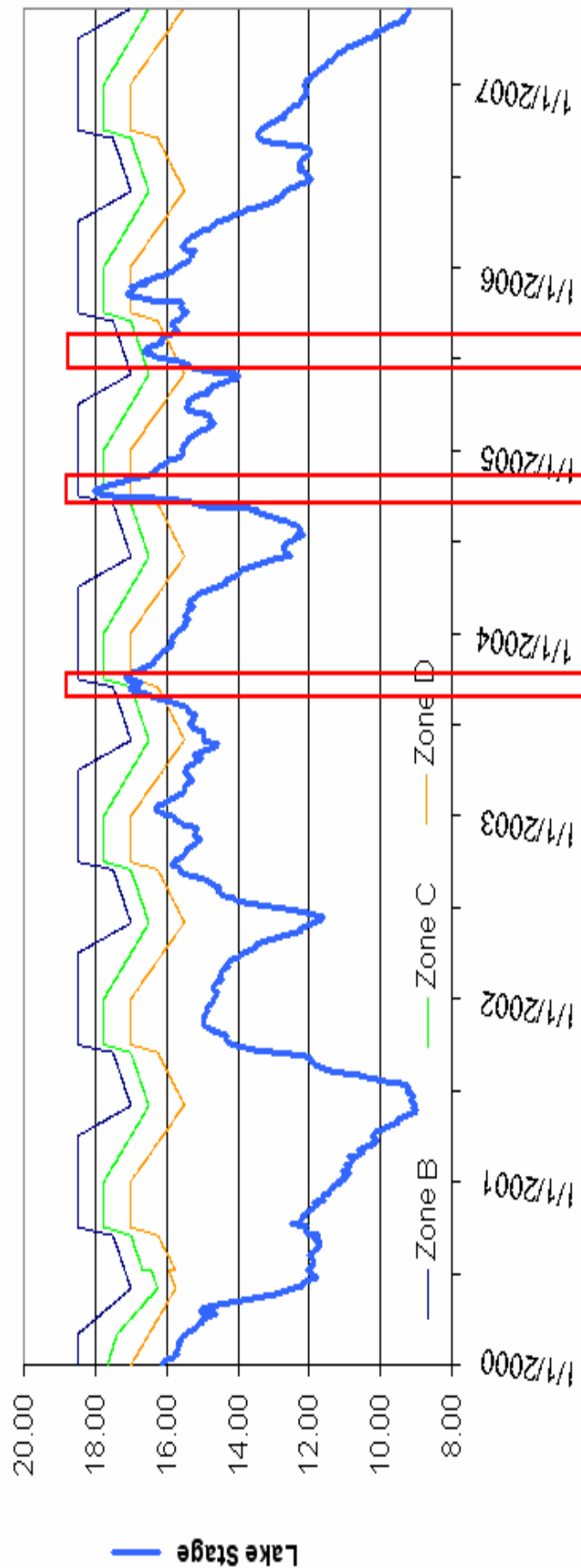
Normalized Weekly Stage Hydrograph for WCA-3A NE

Indicator Region 116 (R39C22-25 R40C25-25)

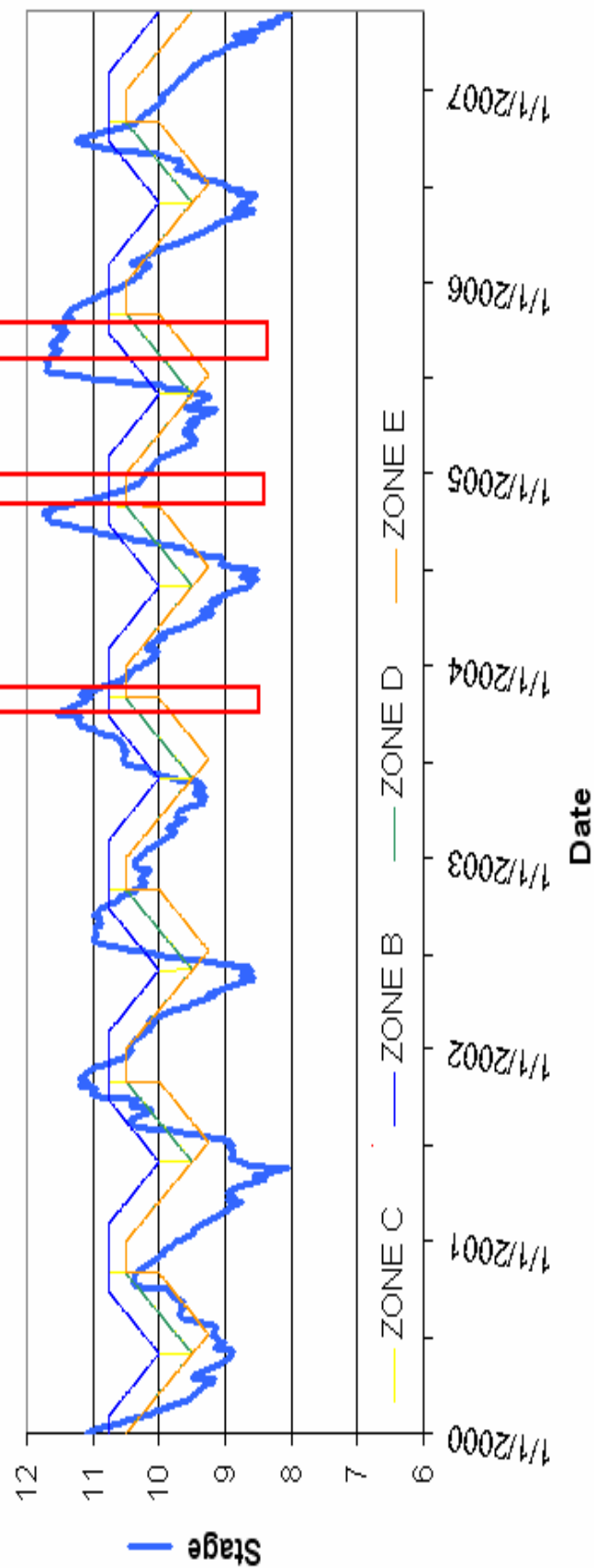


Restudy concluded that a flowway would exacerbate high stages in northern parts of WCAs.

Lake Okeechobee Stage since Jan, 2000



WCA-3A 3-Gage Average since Jan, 2000

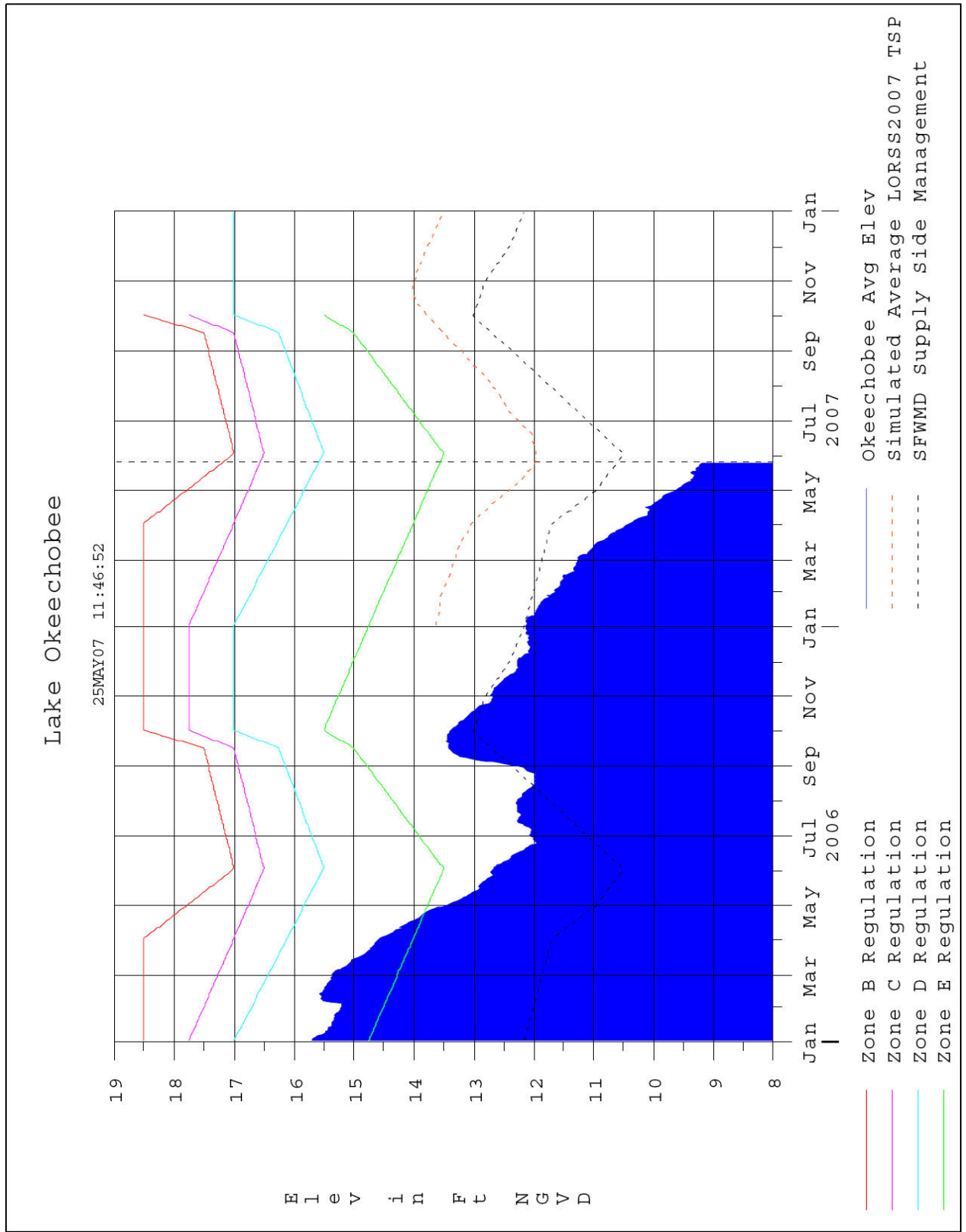




Current Modeling:

- Lake Okeechobee Regulation Schedule Study (LORSS)
 - Reduced Lake Okeechobee releases to WCAs.
 - Stage in WCA-3A too high during wet times.
- Modified Water Deliveries (CSOP)
 - Limits Lake Okeechobee deliveries to the WCAs.
 - Stage in WCA-3A too high during wet times.

“Wetter than Normal” Predictions...



If a flowway was in place, how much lower would Lake Okeechobee be? 23



If “wetter than normal” predictions
are accurate:

*A flowway would worsen high water stages in
the WCA-3A and cause greater endangered
species issues with snail kites, wood storks,
and Cape Sable Seaside Sparrows.*



Review Summary

- New information has not improved the issues associated previously identified with a flowway.
- There is a clear need for managed storage to improve the conditions of the Lake, Estuaries, and WCAs. But, where...?

Flowway Issues

Tommy B. Strowd, P.E.
Assistant Deputy Executive Director,
Everglades Restoration Resource Area

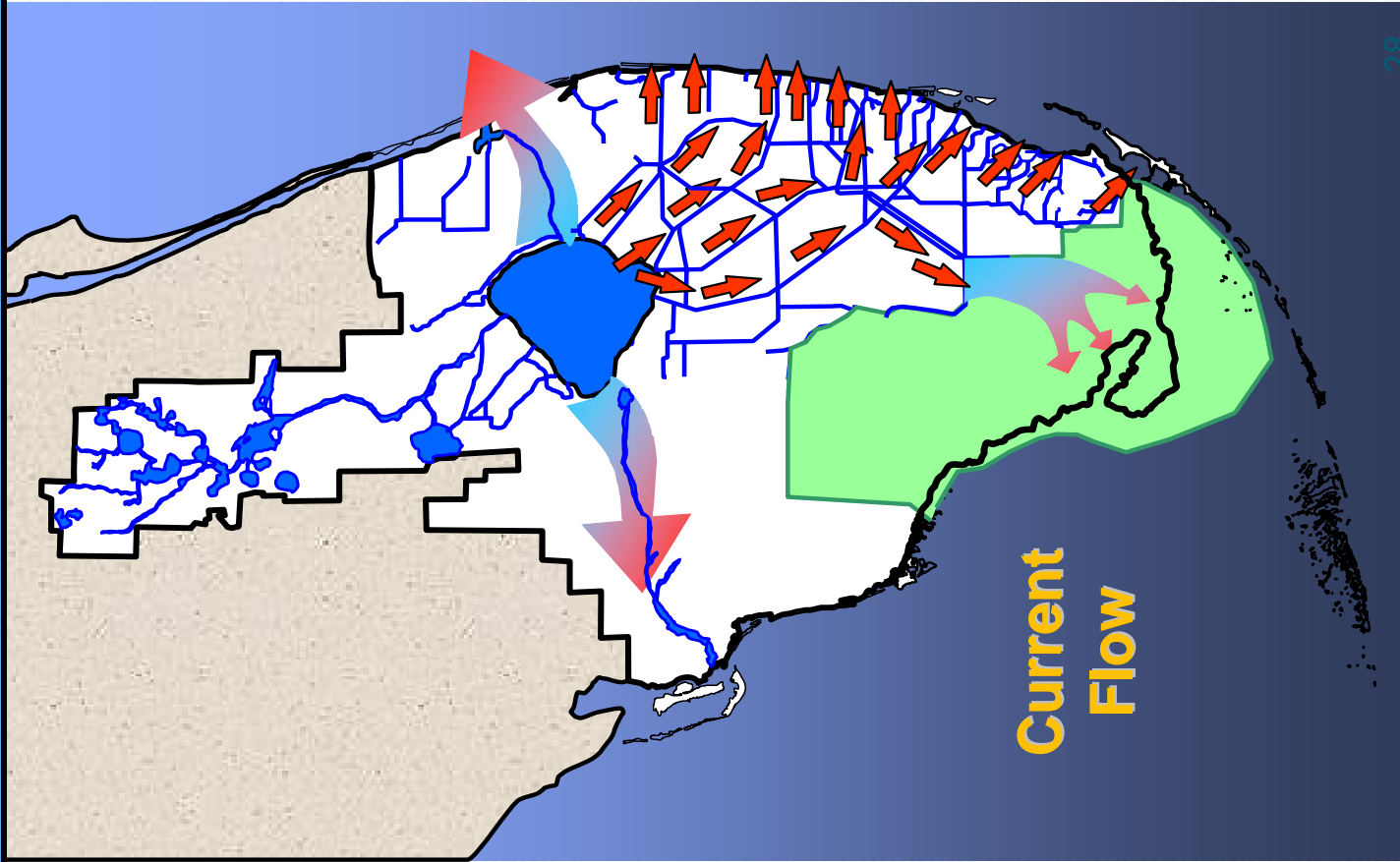
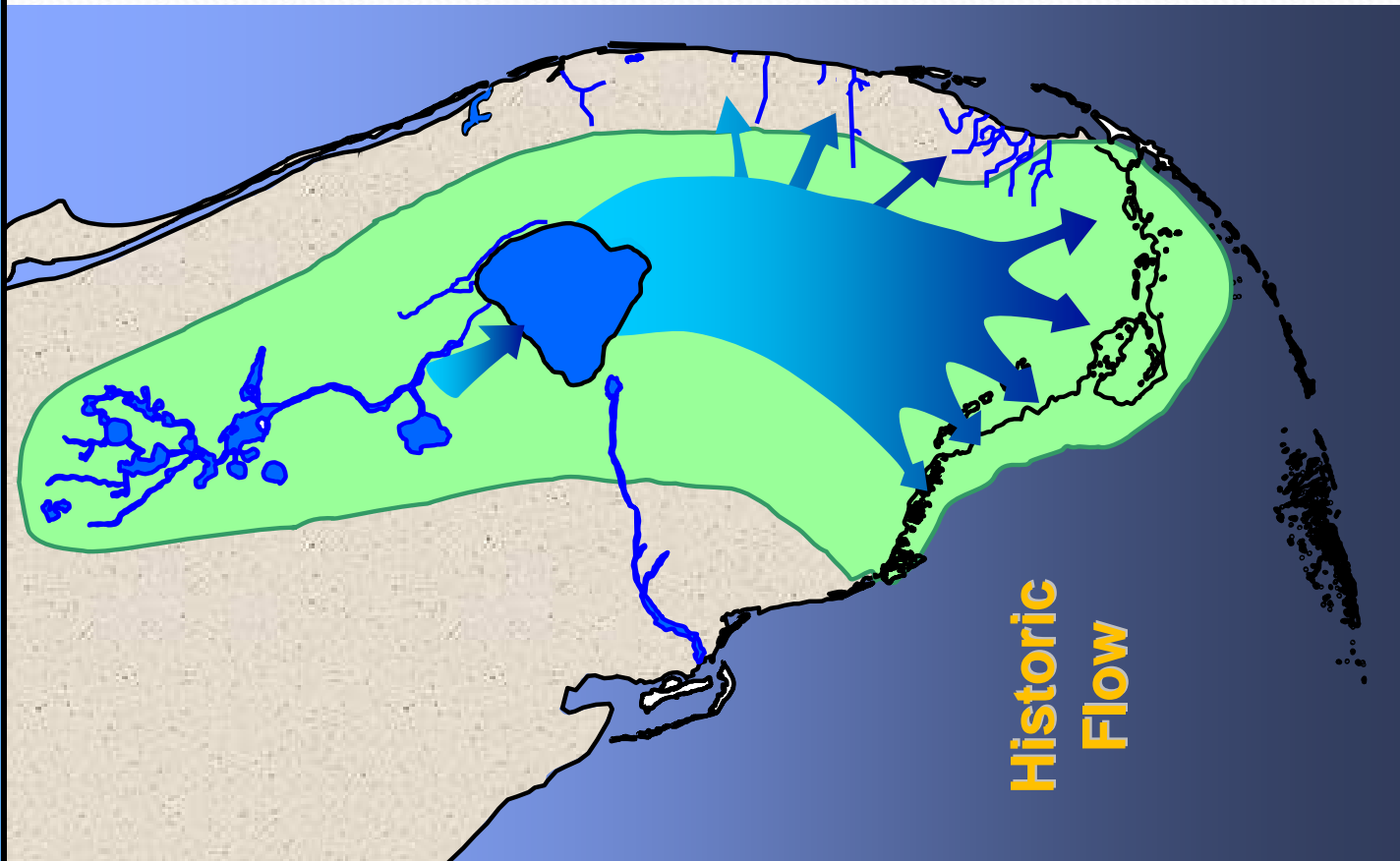




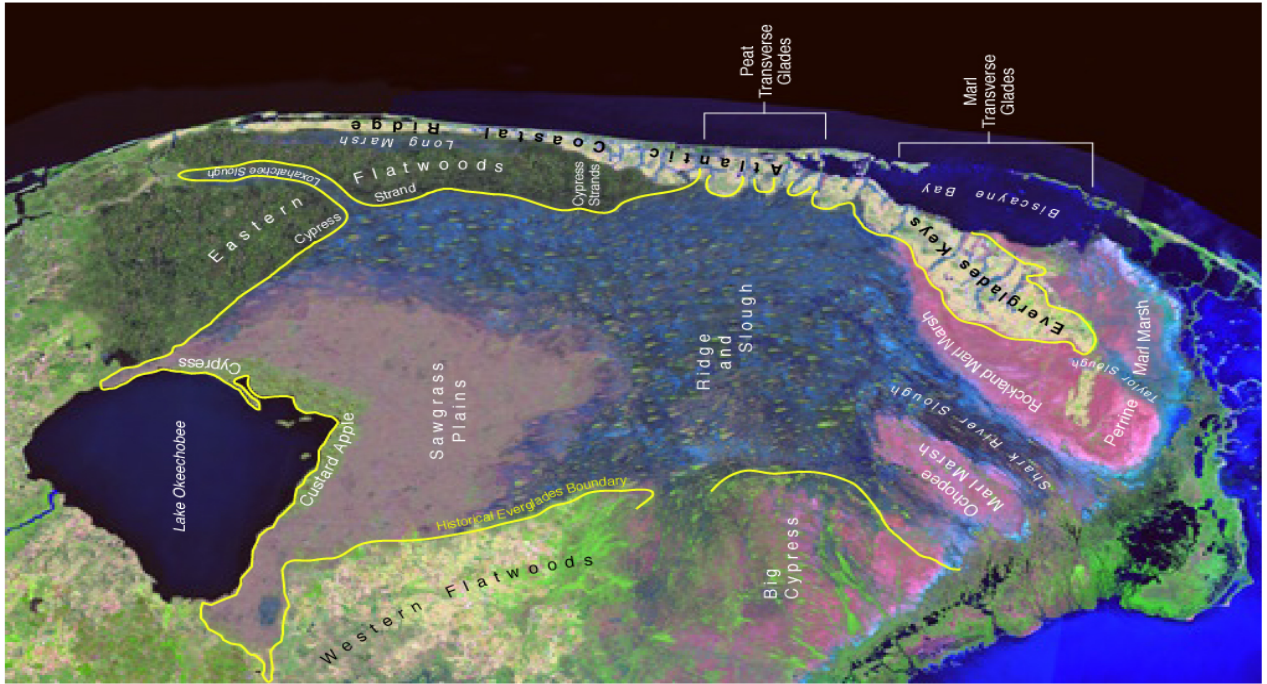
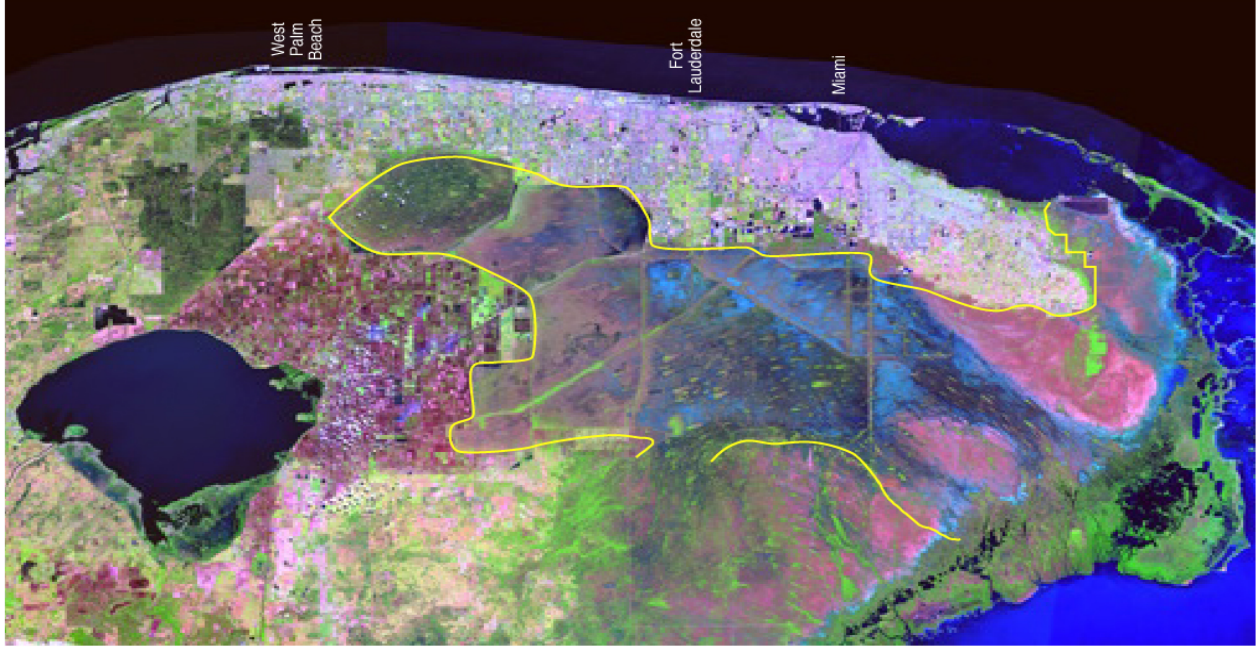
Regional System Changes

- Major changes in regional storage and conveyance over the past 100 years
- Changes in Kissimmee basin removed significant regional storage upstream of Lake Okeechobee
- Regional drainage improvements significantly reduced overall lake surface area and lowered storage depth
 - Estimated ~3 million acre feet of storage lost
- Construction of the protective levee system in the Everglades reduced overall natural area by one-half and constrained flow south from Lake Okeechobee

System Modifications

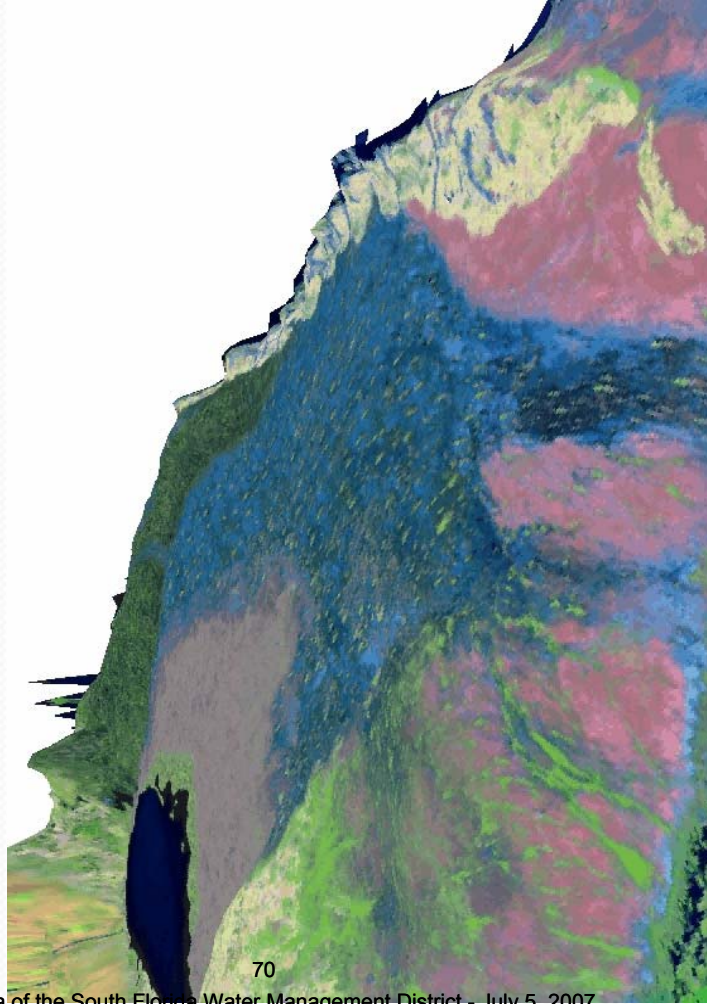


Regional System Changes

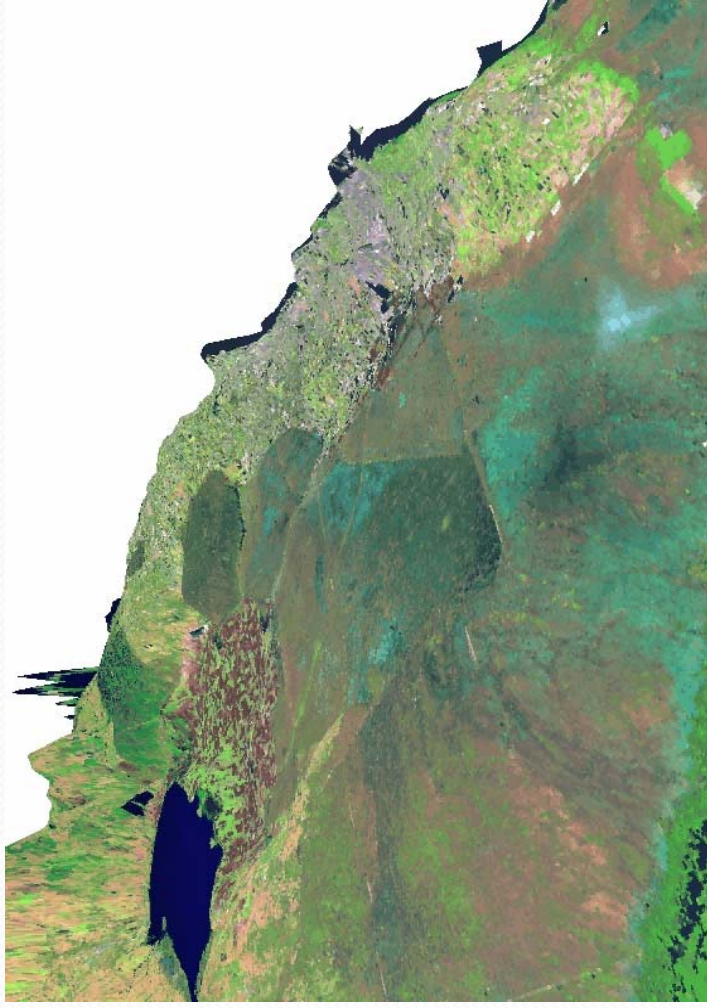


Over half the Everglades lost to urban and agricultural development

Changes in Topography

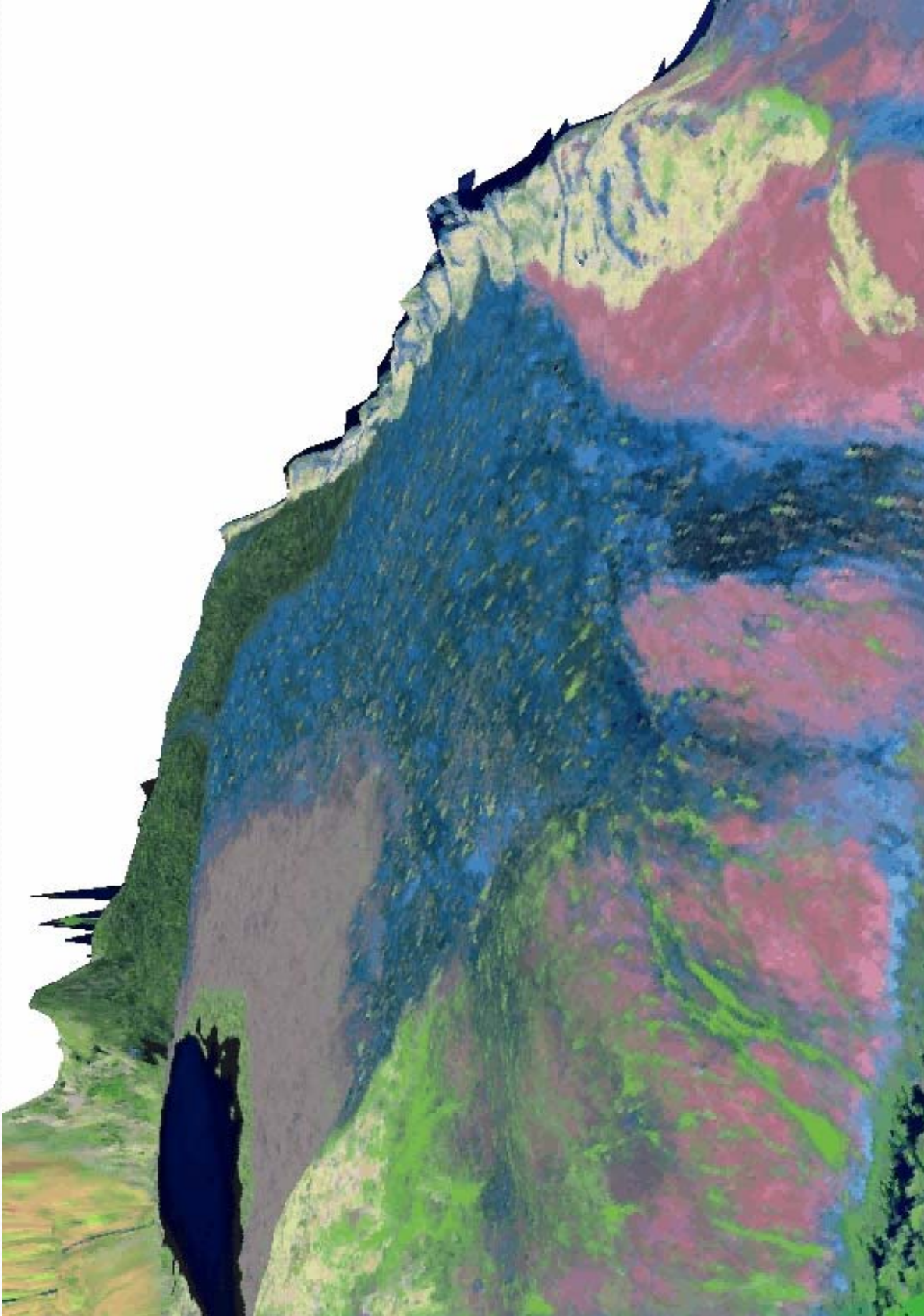


Pre-Drainage Topography

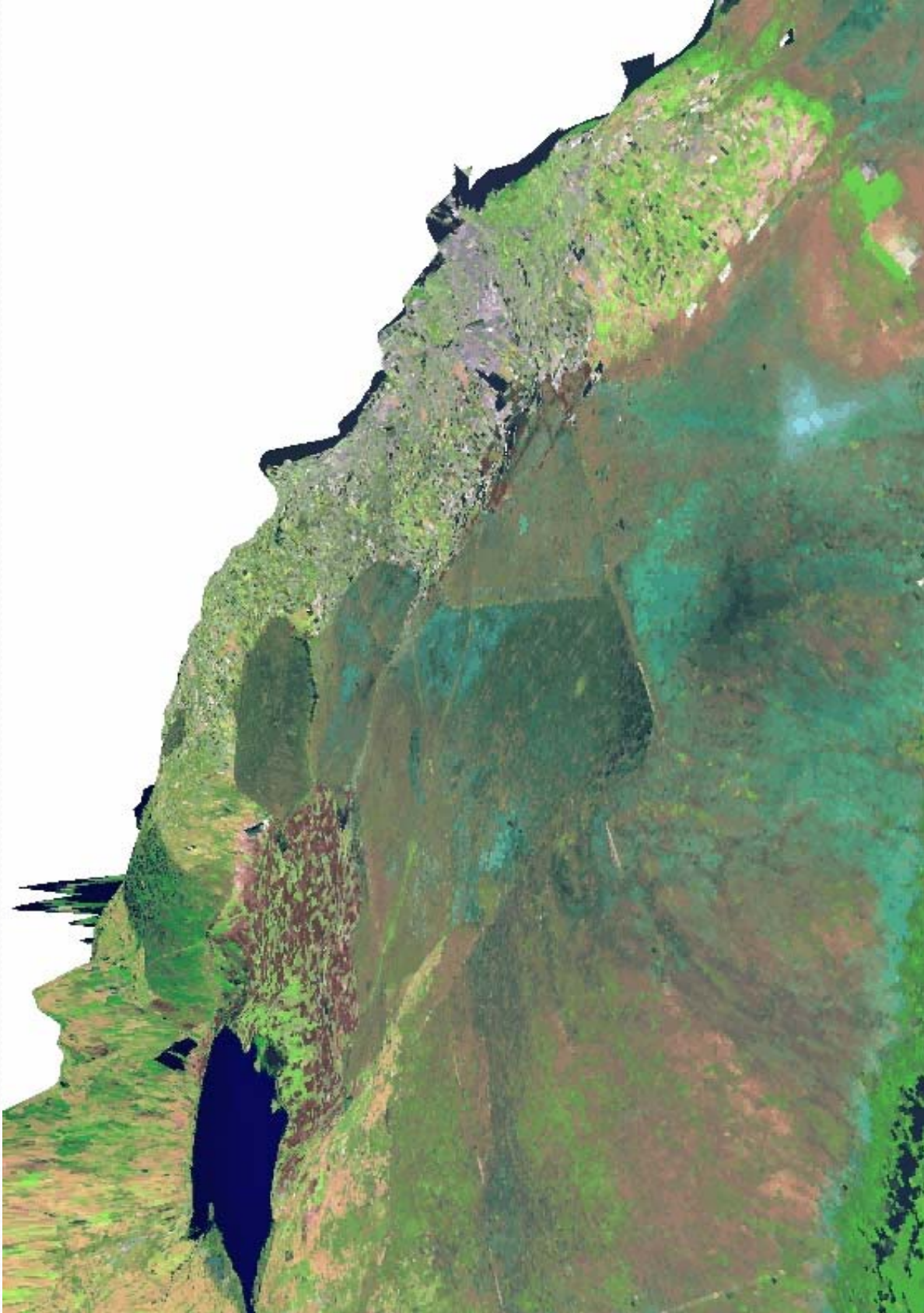


Post-Drainage Topography

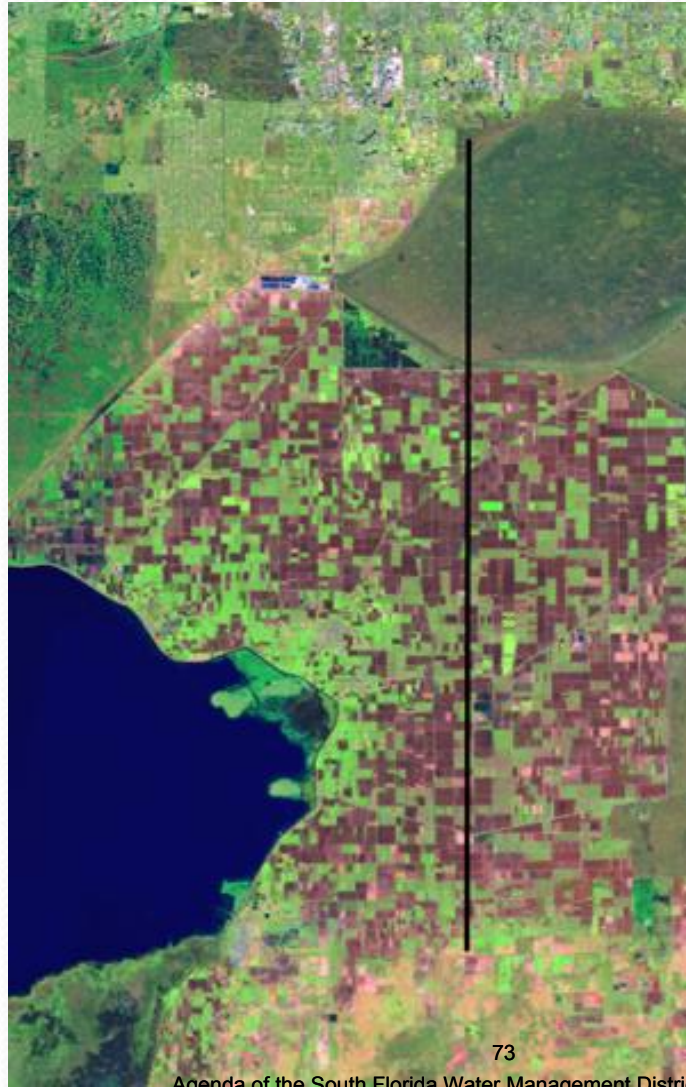
Pre-Drainage Topography



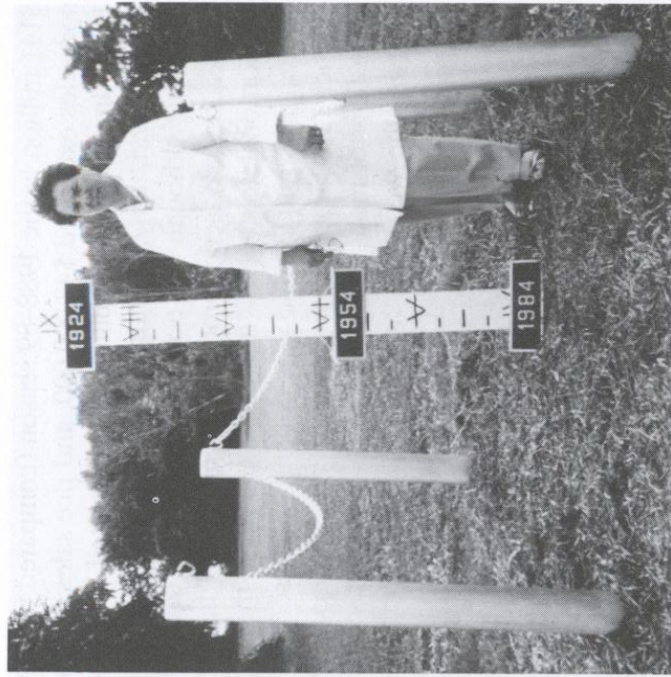
Post-Drainage Topography



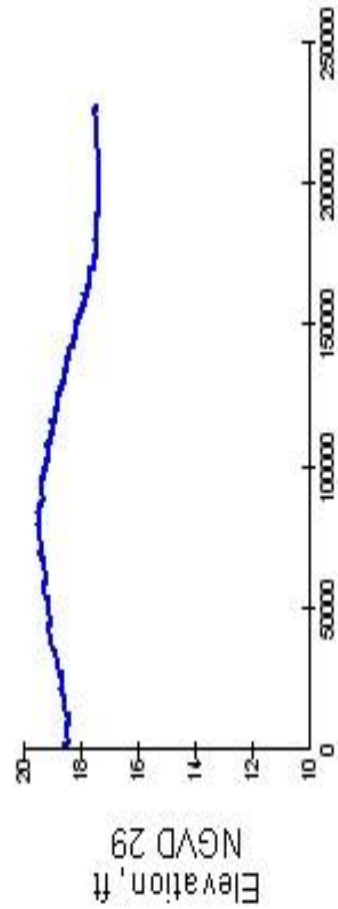
Profile Line through the Historic System and in the Current System



73



Historic EAA

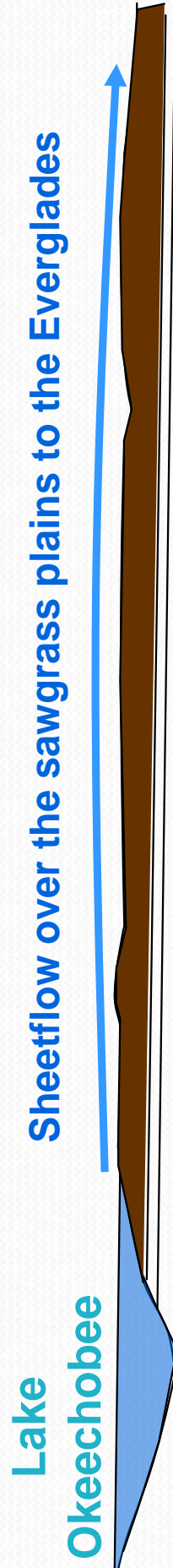


Present EAA



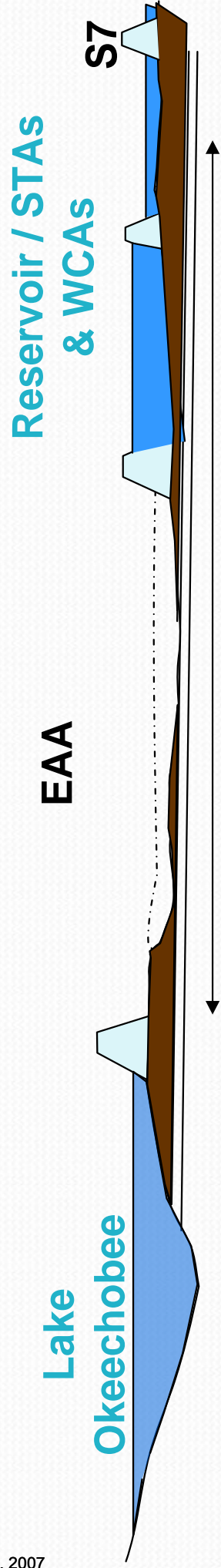
Soil Subsidence

HISTORICAL



74

PRESENT



Water will not naturally flow from a shallow flowway to the WCA-3A.



Subsidence Effect on Flowway Concept

- Without significant land leveling or cell construction in 117,000+ acres of EAA land, the flowway:
 - would have significantly varying depths
 - will not have STA-like benefits due to constant wetting and drying of large areas
- Inflows and outflows will have to be pumped

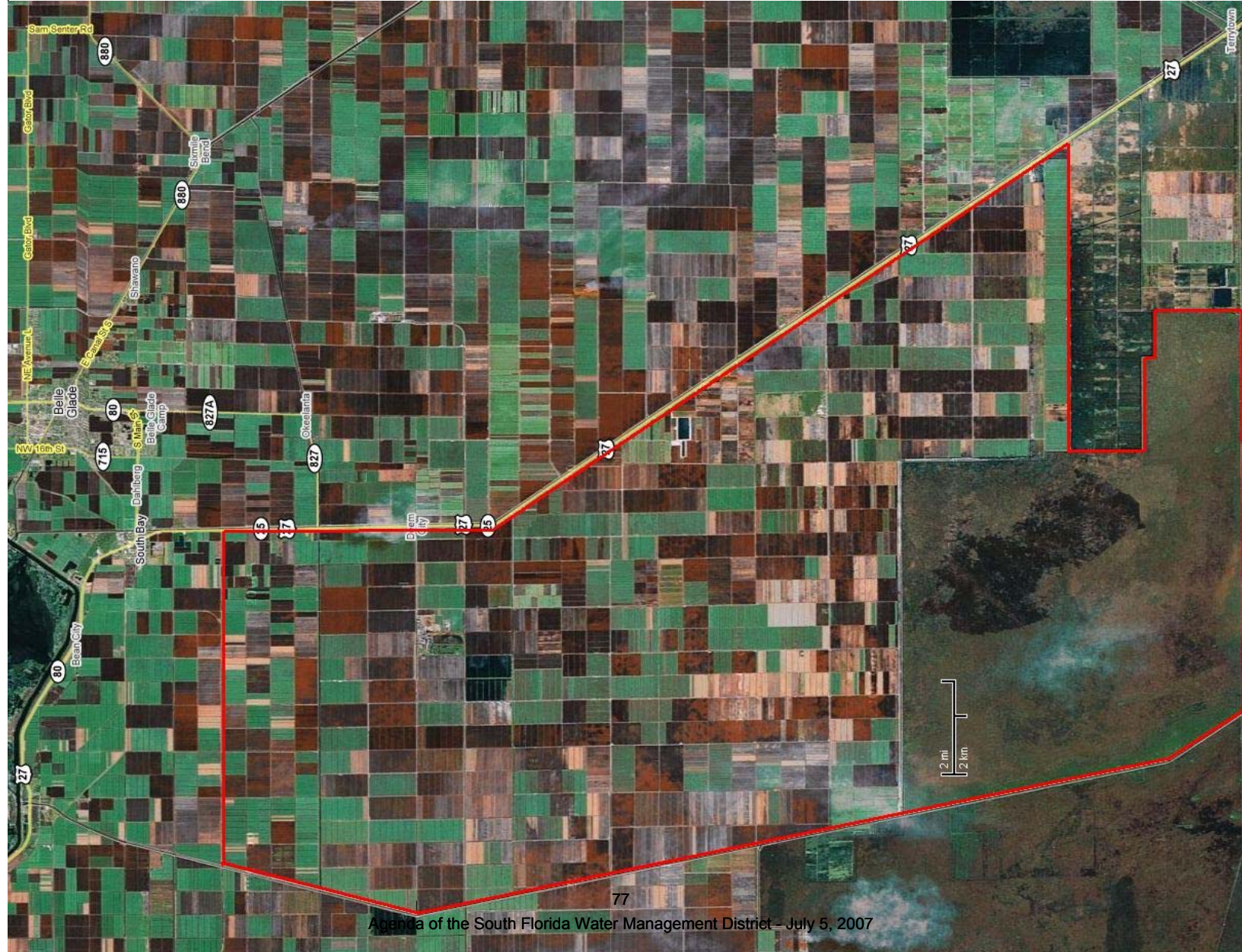


Increased Evapotranspiration Effect on Flowway Concept

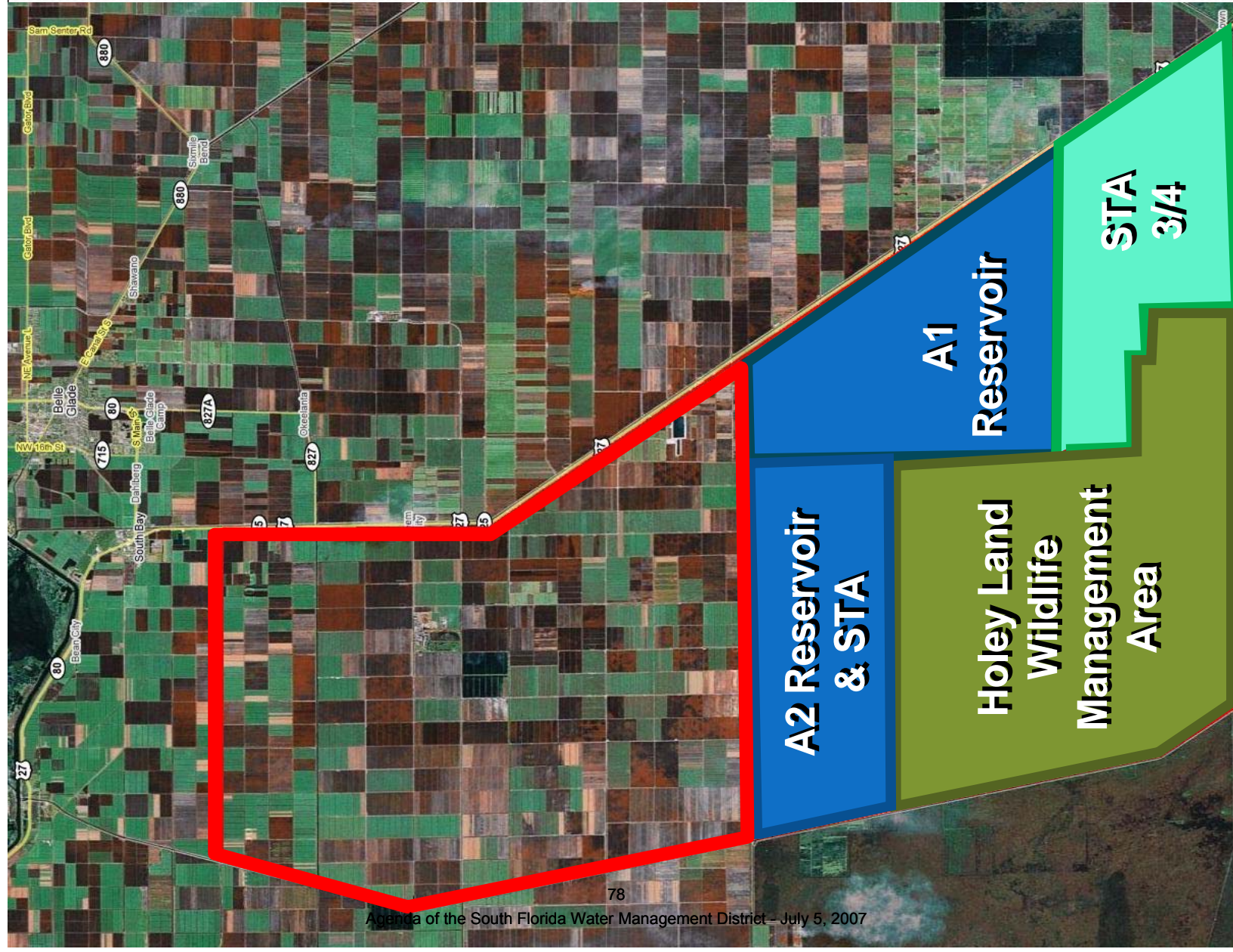
- Greater water loss than EAA crops because water is held higher
 - flowway must be covered with water during dry times to maintain wetland vegetation for water quality treatment purposes
- Results in less water available for the WCAs, Everglades National Park, Estuaries, Lake Service Area, and Lower East Coast in dry times

Plan 6

EAA flowway
117,288 acres



Remaining opportunity for EAA flowway 60,000 acres



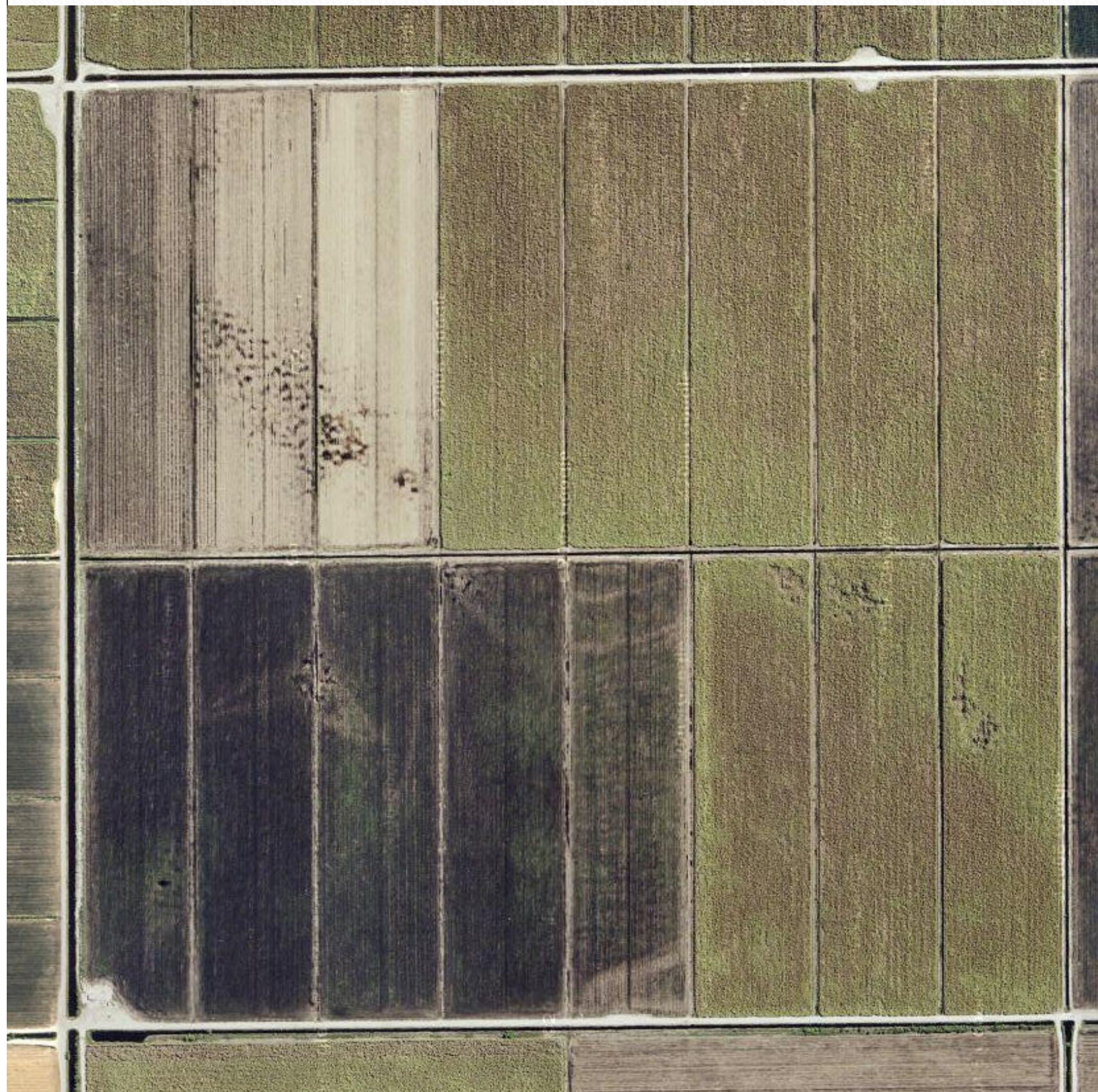
Existing Infrastructure



Processing/Distribution Plant



- Raw Sugar Mill
- Refinery
- Packaging
- Distribution
- Power Co-Gen







Infrastructure Issues

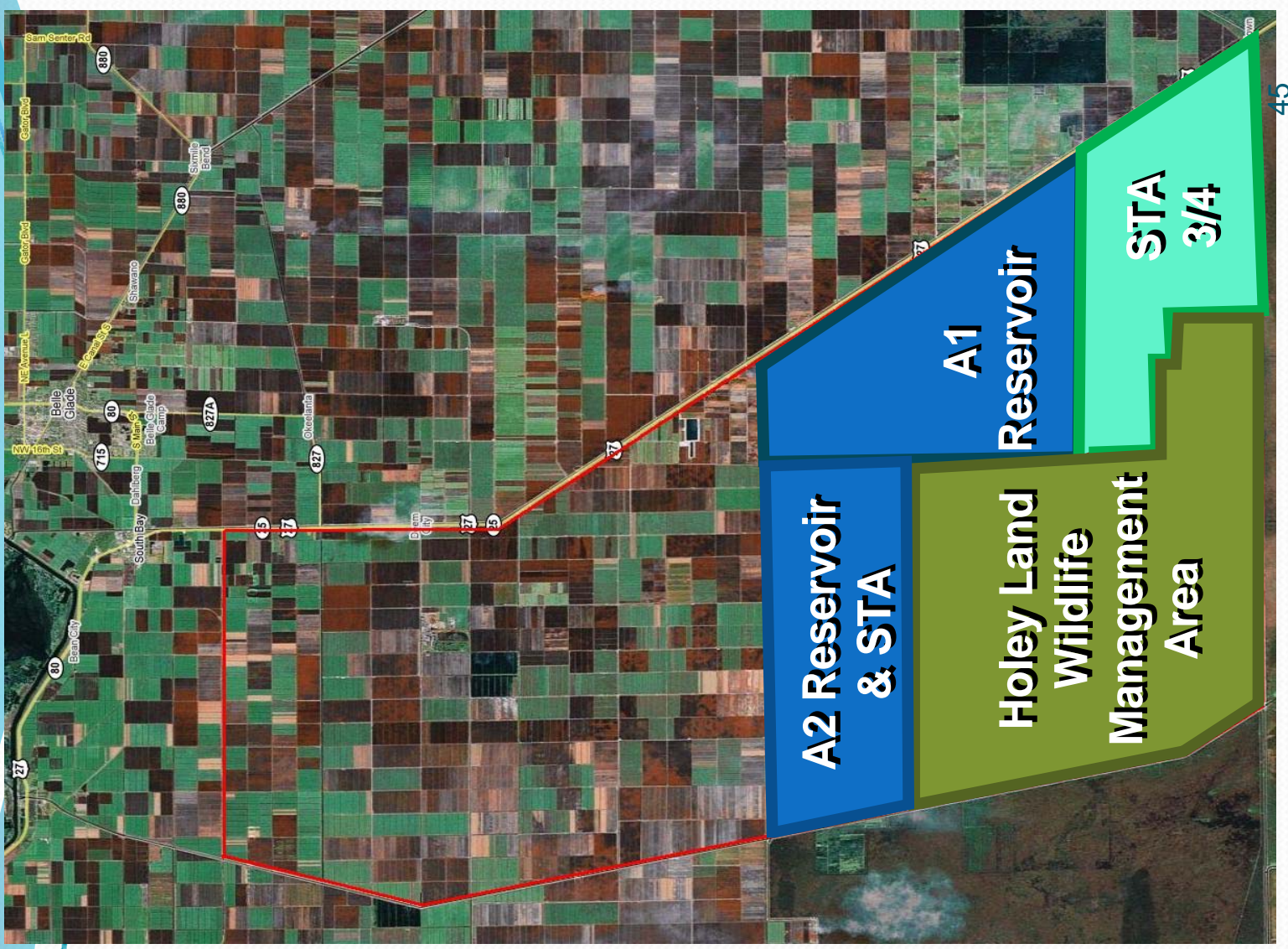
- Land acquisition
- Business value
- Purchase of processing & distribution plant
- Construction of new bridges
- Relocation of railroad facilities
- Removal of all interior agricultural levees
- Construction of new perimeter embankments (Safety Stds)
- Greater seepage management costs (O&M pumping)
- Modifications to existing & future restoration projects
- Modifications to existing & future water quality projects required to comply with federal court settlement
- **Land and infrastructure requirements for a flowway result in a multi-billion dollar water resource project**

Current Restoration Plan

- CERP proposes Surface Storage Reservoirs, improved canal conveyance and Stormwater Treatment Areas to meet Everglades water needs
 - A1 Reservoir – 17,000 acres, 12 feet deep (190,000 ac-ft)
 - A2 Reservoir – 14,000 acres, 12 feet deep (170,000 ac-ft)
- | | |
|-------|--|
| TOTAL | 31,000 acres, 12 feet deep (360,000 ac-ft) |
|-------|--|
- STA 3 / 4 (Existing) - 16,500 acres
- New A2 STA – 7,000 acres to 17,500 acres
- A1 Reservoir will meet most Everglades’ water needs considering MODWATERS flow improvements
- A2 / A1 Reservoirs will meet most of the Everglades’ water needs considering WCA-3A Decompartmentalization

Current Restoration Plan

- The proposed plan of deep reservoirs associated with Stormwater Treatment Areas is more cost effective than Flowway alternatives
- Shallow STA-like facilities are about 2 times the cost of a deep water reservoir of the same volume.



Aquifer Storage & Recovery

- Several ASR pilot projects are currently under construction
 - C-43 ASR Pilot
 - Initial results indicate this area is not suitable for ASR
 - Lake Okeechobee ASR Pilot
 - Looking at 'groups' of ASR wells
 - Hillsboro ASR Pilot
- ASR Regional Study
 - Interim Report, Fall 2007
- ASR Contingency Plan due in December 2007
- These efforts will help assess the efficiency of ASR in CERP

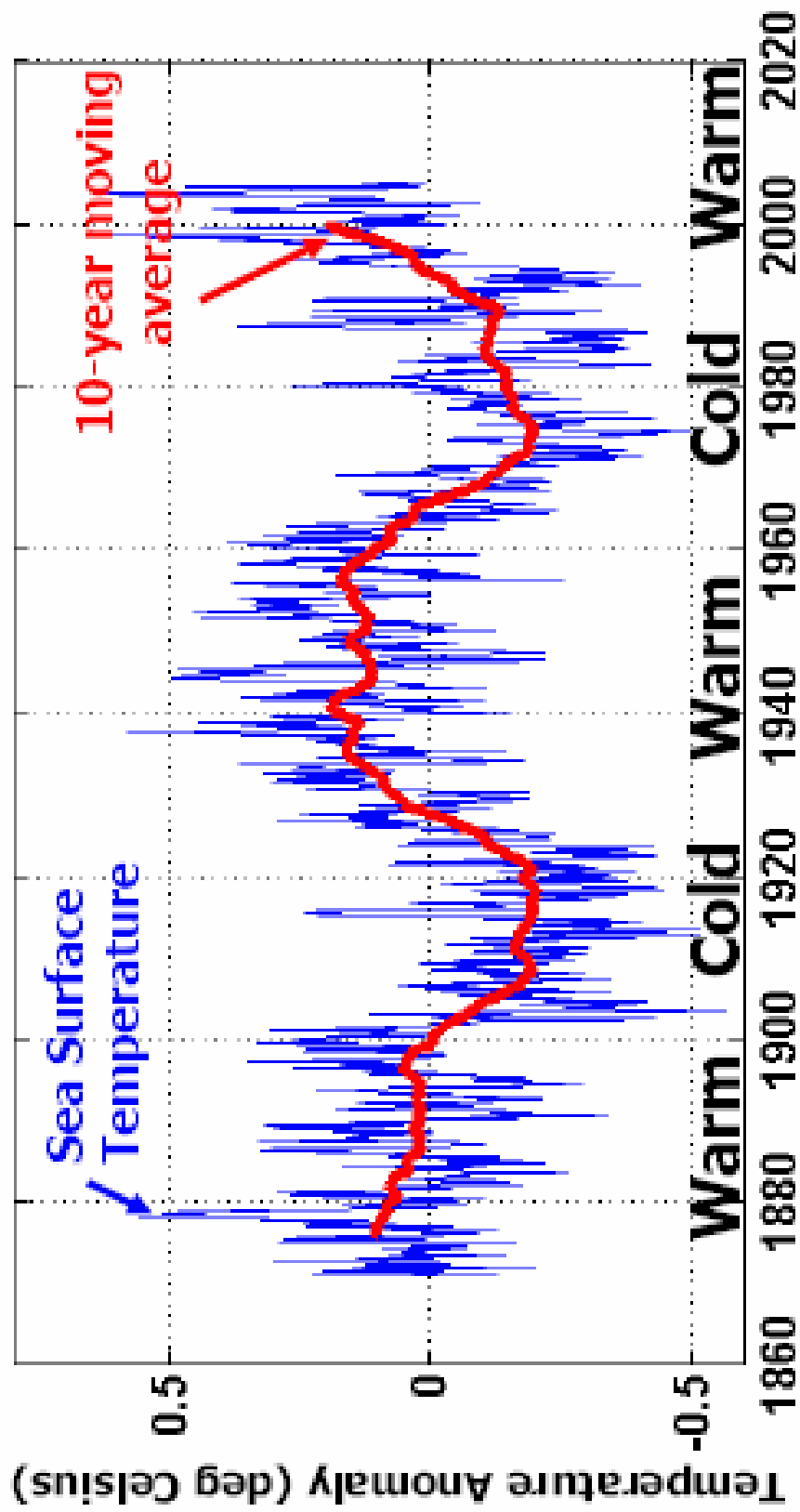




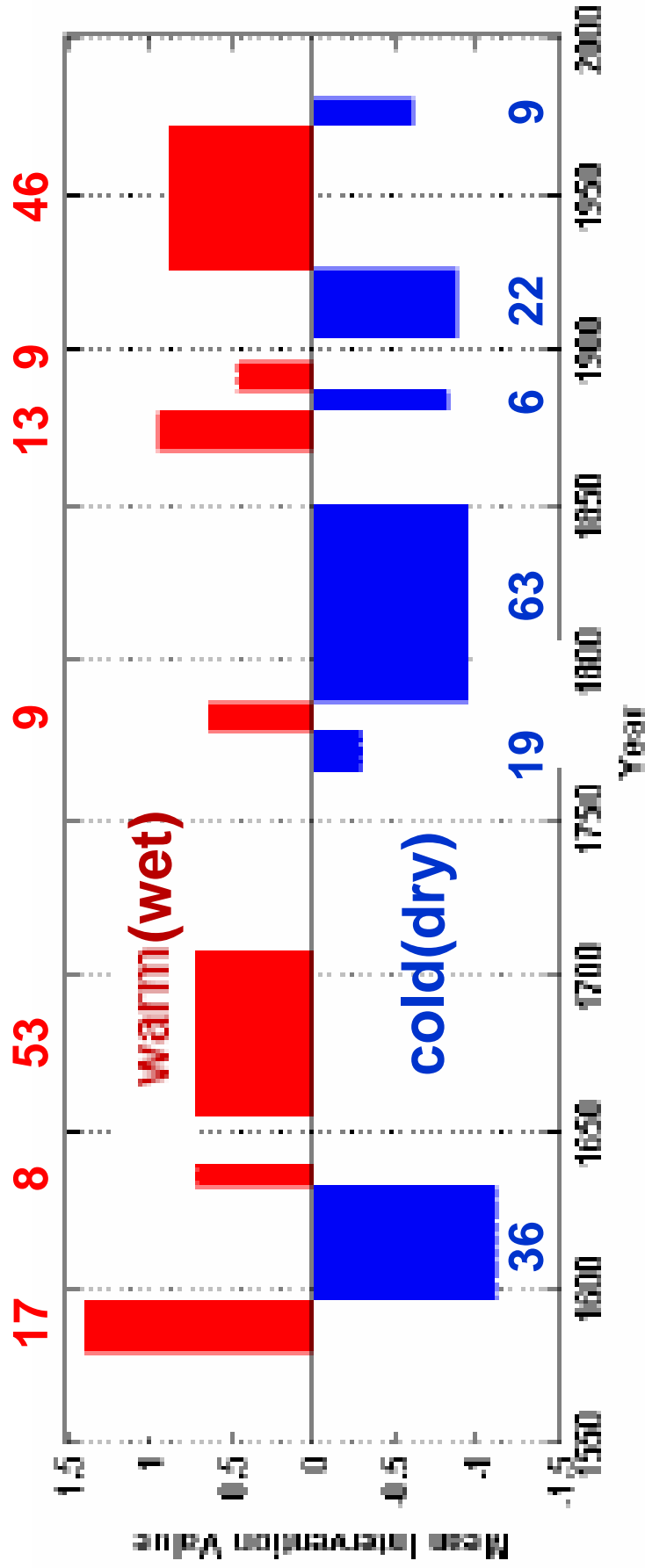
Climatology

- Atlantic Multi-decadal Oscillation
 - Temporal Variability
 - Other Climate Factors
 - Water Resource Engineering Design

AMO Short Term View



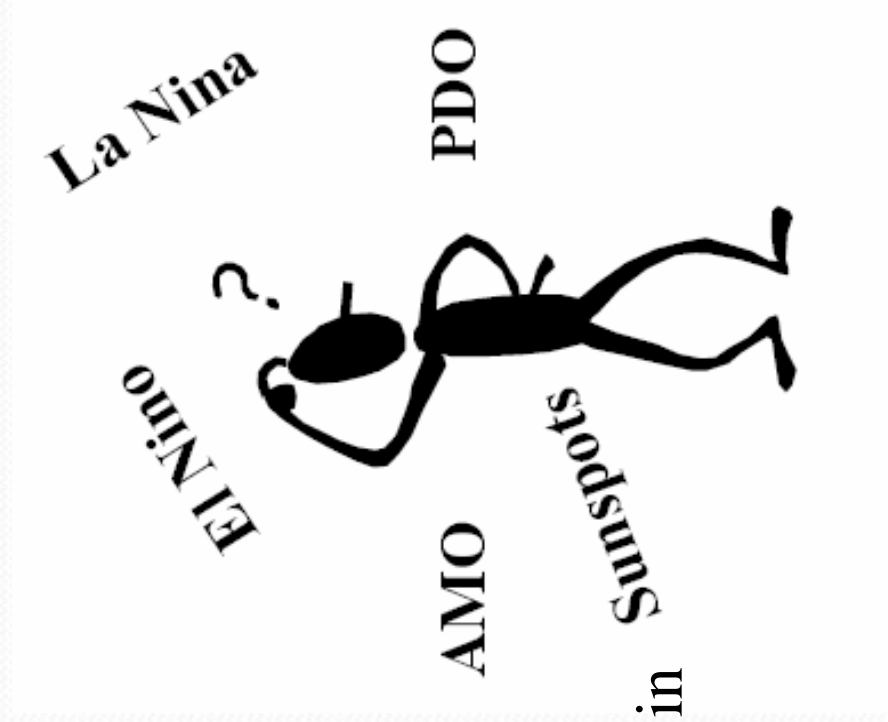
AMO Long Term View



Durations of significant warm (red) and cool periods. Reconstructed values of North Atlantic Sea Surface Temperature (SST) anomalies using tree-ring technology

Other Climate Cycles & Events

- Atlantic Multi-decadal Oscillation
- Pacific Multi-decadal Oscillation
- El Nino / La Nina (Pacific Ocean)
- Solar Activity (Sunspots)
- Volcanic Activity
- Global Warming?
- All of these have some effect on rainfall in Florida
- Interactions of these events make long range forecasts extremely uncertain



Climate Based Design

- Extreme uncertainty with climate based rainfall projections
 - The best climate / rainfall correlations (El Nino / La Nina) have often proven poor predictors of regional rainfall
 - 2006 / 2007 El Nino Event
 - Wetter than normal dry season projected
 - 2006 / 2007 Record Drought
- Expanding CERP water resource facilities based on the uncertain effects of the AMO risks billions of taxpayer dollars
 - By the time these large facilities are constructed, the current AMO cycle could shift back to the dry phase

Summary

- The regional drainage improvements reduced the storage in Lake Okeechobee by approximately 3 million acre feet (Equivalent Lake Depth : ~6 ft.)
 - There has been no significant reduction in inflow compared to the natural system condition
- The remaining Everglades is only $\frac{1}{2}$ of its original size and cannot tolerate more water in wet periods
 - During wet periods, when the Lake is most likely to require discharges to manage high stages, water levels in the Water Conservation Areas are typically too deep to accept the additional inflow without environmental damage
 - Climate indications of wetter future conditions will only exacerbate this problem



Summary

- During dry to normal periods, excess water from Lake Okeechobee would often not be available to maintain the wetland plant communities necessary to meet the environmental or water quality objectives of a flowway
 - May export nutrients upon re-wetting
- Ecosystem constraints in the Everglades may preclude sending flood discharges from Lake Okeechobee south
 - Cape Sable Seaside Sparrow
 - Snail Kites
 - Tree Islands



Summary

- Based on extensive experience in the construction of Stormwater Treatment Areas and Reservoirs in the EAA, it is evident that a flowway would be an extremely expensive, multi-billion dollar project
 - Extensive perimeter impoundment
 - Large pumping stations
 - Land terracing or cell construction
 - Considerations for existing infrastructure
 - Removal of roads, railroads, ditches, etc.
 - Removal of processing, packing, distribution and power facilities
 - Site remediation
 - Land and business acquisition



Summary

- Every agency study has recommended that storage, conveyance and treatment are needed to restore the regional ecosystem
- No agency study has recommended the EAA flowway as a component of CERP
- Given the flow limitations south combined with the limited storage capability in a shallow flowway, the actual benefits to Lake Okeechobee and the estuaries are uncertain
 - The potential for impacts to the Everglades is significant



Solutions

- The problems associated with Lake Okeechobee and the estuaries are best addressed upstream of the Lake, at the source
- *The Northern Everglades and Estuaries Protection Program*, established by the Florida Legislature, affords the best opportunity to accomplish this
- *The Northern Everglades and Estuaries Protection Program* is planned to complement the ongoing state and federal activities including CERP, Acceler8, and the Everglades Construction Project that are working to address storage, treatment, and conveyance solutions north of the Lake, the St. Lucie and Caloosahatchee Rivers, and the Everglades.

Recommendation

- Dedicate resources to development and implementation of the of the Northern Everglades and Estuaries Protection Program and the ongoing Everglades restoration efforts including the Everglades Construction Project and CERP
- Commitment of additional resources to further investigate a southern flowway are not warranted at this point in time
- Cost effective opportunities for additional storage, treatment and conveyance will continue to be evaluated in the implementation of the Everglades restoration components

Questions



11. Clarifying State Assurances for Accelerate Projects - Ken Ammon, Deputy Executive Director, Everglades Restoration, SFWMD 15p 15d

12. Lake Okeechobee Committee Report - Malcolm "Bubba" Wade, Chair

10p 10d

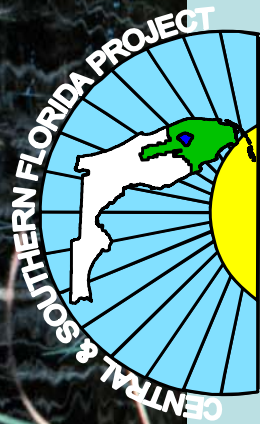
13. Melaleuca and Other Exotic Plant Eradication - Biological Controls Project Update - Shauna Allen, Project Manager, U.S. Army Corps of Engineers (USACE); and John Morgan, Project Manager, Everglades Restoration, SFWMD 10p 10d

See supporting document: [MelBioControlTSP_Brief.pdf](#)

- Public Comment 15m

Melaleuca Eradication and Exotic Plants - Implement Biological Controls

Project Managers:
Corps – Shauna Allen
SFWMD – John Morgan, Jr.



COMPREHENSIVE
EVERGLADES
RESTORATION PLAN



Outline

- Project Background
- Existing and Future without Conditions
- Alternative Plan Formulation
- Project Milestones



Authorization

- Section 601 of WRDA 2000
- “This project calls for the mass rearing, field release, establishment and field monitoring of approved biological control agents for *Melaleuca* and other exotic plants.”
- This project falls under the “Programmatic Authority”; total project cost less than \$25M
- Approval authority is ASA(CW)



Project Purpose

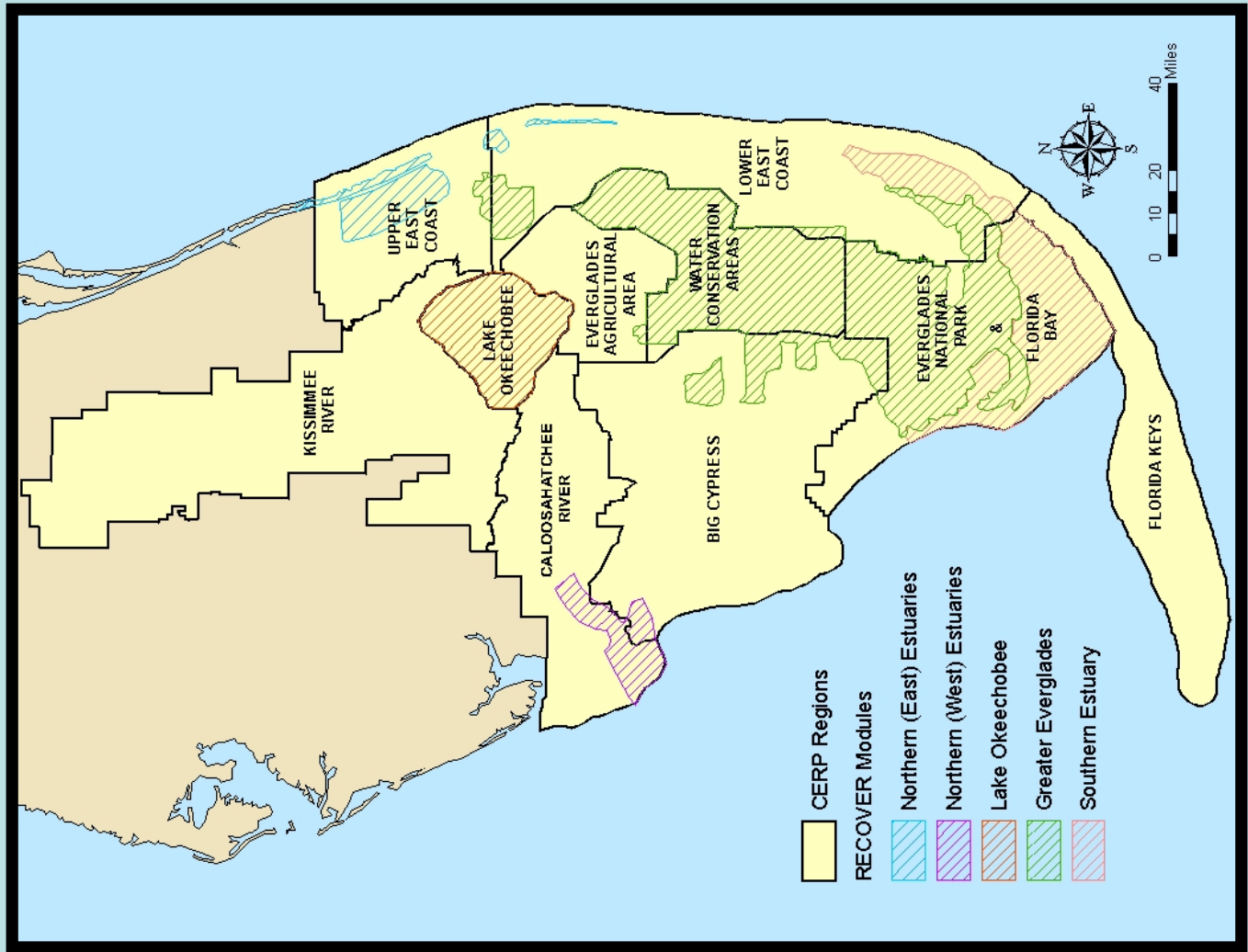
*To increase the effectiveness of
biological control technologies
to manage Melaleuca and other
exotic plants.*



Project Team Members

- **US Army Corps of Engineers (USACE)**
 - Terry Artrip, Kevin Wittmann, Susan Conner, Jon Lane, Larry Taylor, Shauna Allen
- **South Florida Water Management District (SFWMD)**
 - John Morgan, Jr., LeRoy Rodgers
- **US Department of Agriculture (USDA)**
 - Paul Pratt, Allen Dray and Ted Center
- **US Fish & Wildlife Service (USFWS)**
 - Art Roybal
- **US Department of Interior (USDOI)**
 - Robert Doren

Study Area Map



Yellow Book Plan

Component	Status
Part A - construction of a new Melaleuca quarantine and research facility.	Complete A new facility was constructed by the without federal support.
Part B - renovation of an existing facility at the University of Florida in Gainesville.	Suspended Lack of sponsor support. This facility is phasing out weed biological control quarantine testing.
Part C - mass rearing, field release, establishment and field monitoring of approved biological control agents for Melaleuca and other invasive exotic species.	In Progress Subject of this PIR



Reaffirmation of YB

- **“Reaffirmation” PIR**
 - Included in the Yellow Book Plan
 - Needs/Objectives have not changed
 - No new purpose added
 - Other alternatives considered
- **Optimize design concepts from YB**

Project Features

- **Mass Rearing, Field Release, Establishment and Field Monitoring of approved biological control agents for:**
 - Melaleuca
 - Lygodium
 - Brazilian Pepper
 - Australian Pine
- **Design and Construction of Mass Rearing Annex at USDA's Davie, FL Quarantine Facility**



Benefits

- **Primary System Benefits**
 - Prevents expansion of invasive exotics into natural areas
 - Reduces coverage of invasive exotics
 - Reduces density of invasive exotics
- **Secondary System Benefits**
 - Promotes reestablishment of native plants
 - Restores native habitat for native birds and wildlife species
 - Reduces stressors on rare, threatened and endangered species





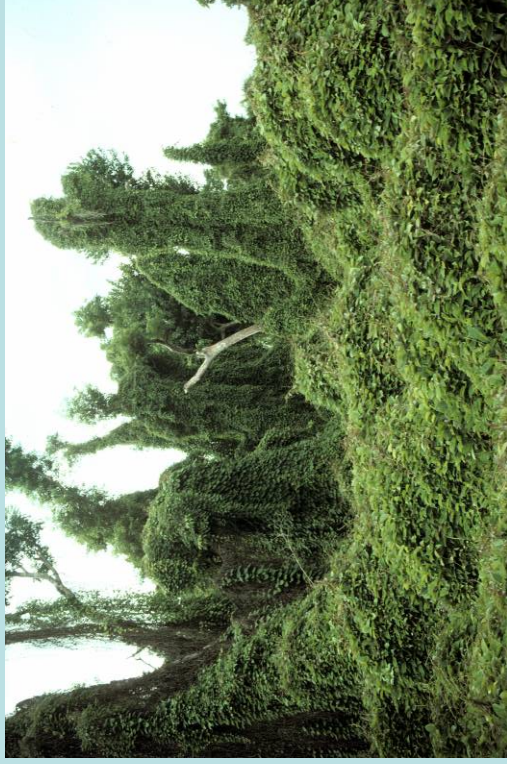
Existing and Future without Project Conditions

Melaleuca Eradication and Exotic Plants- Implement Biological Controls

Four of the Worst Weeds



Melaleuca



Lygodium

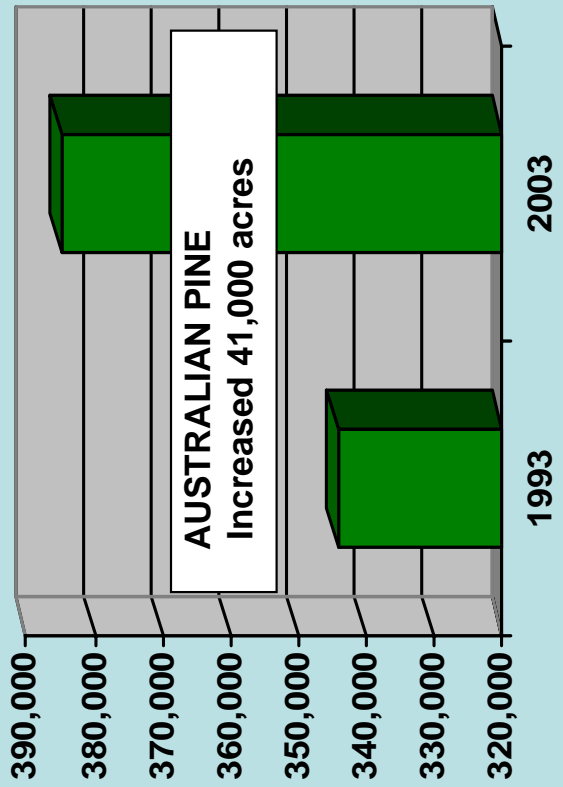
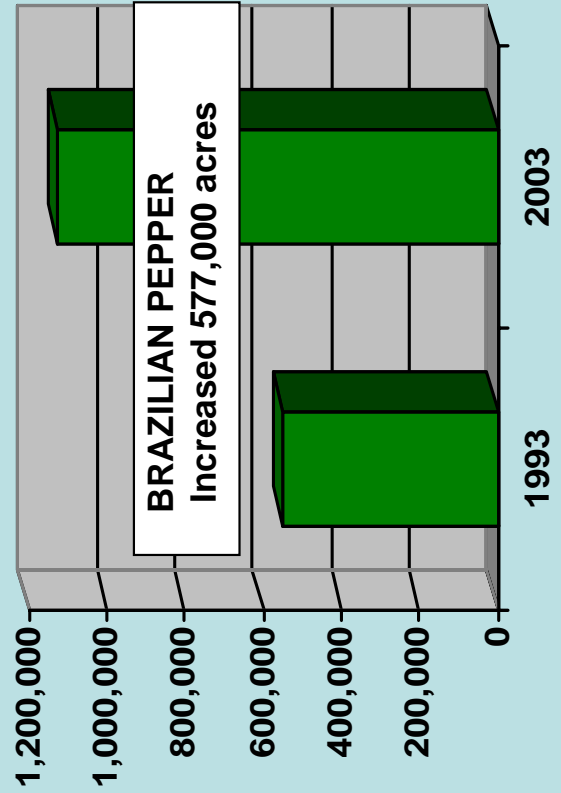
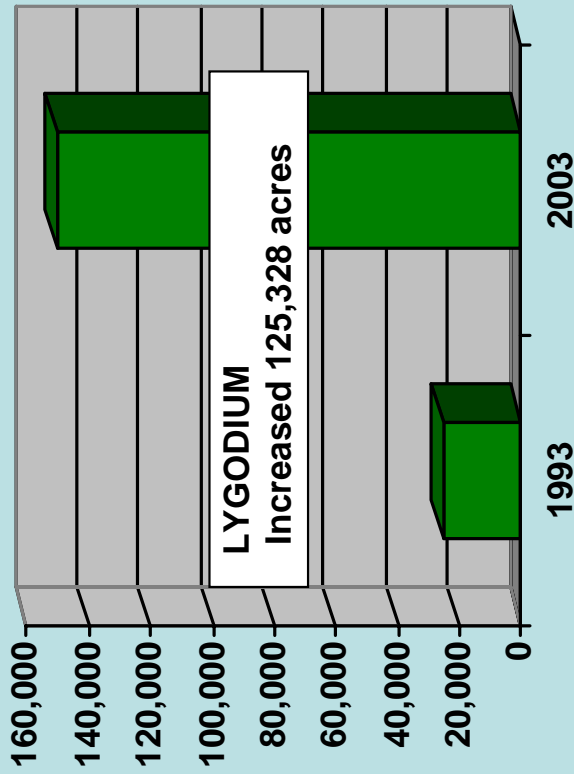
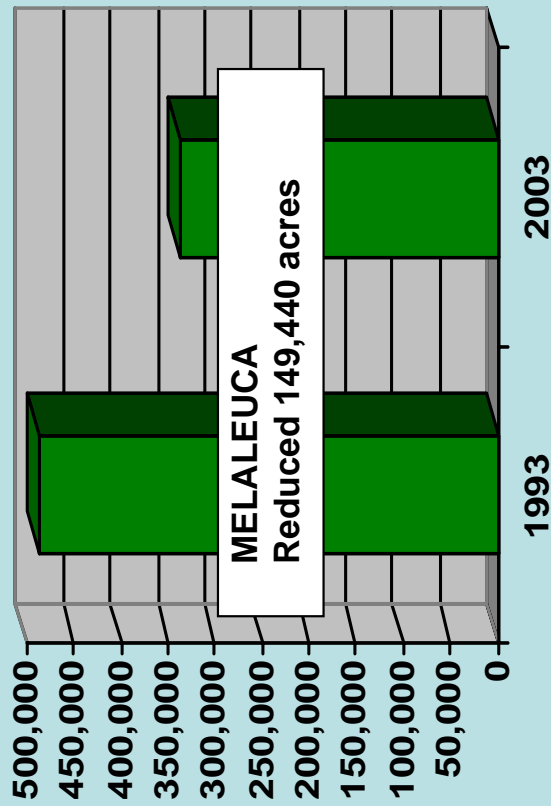


Brazilian Pepper



Australian Pine

Existing Conditions



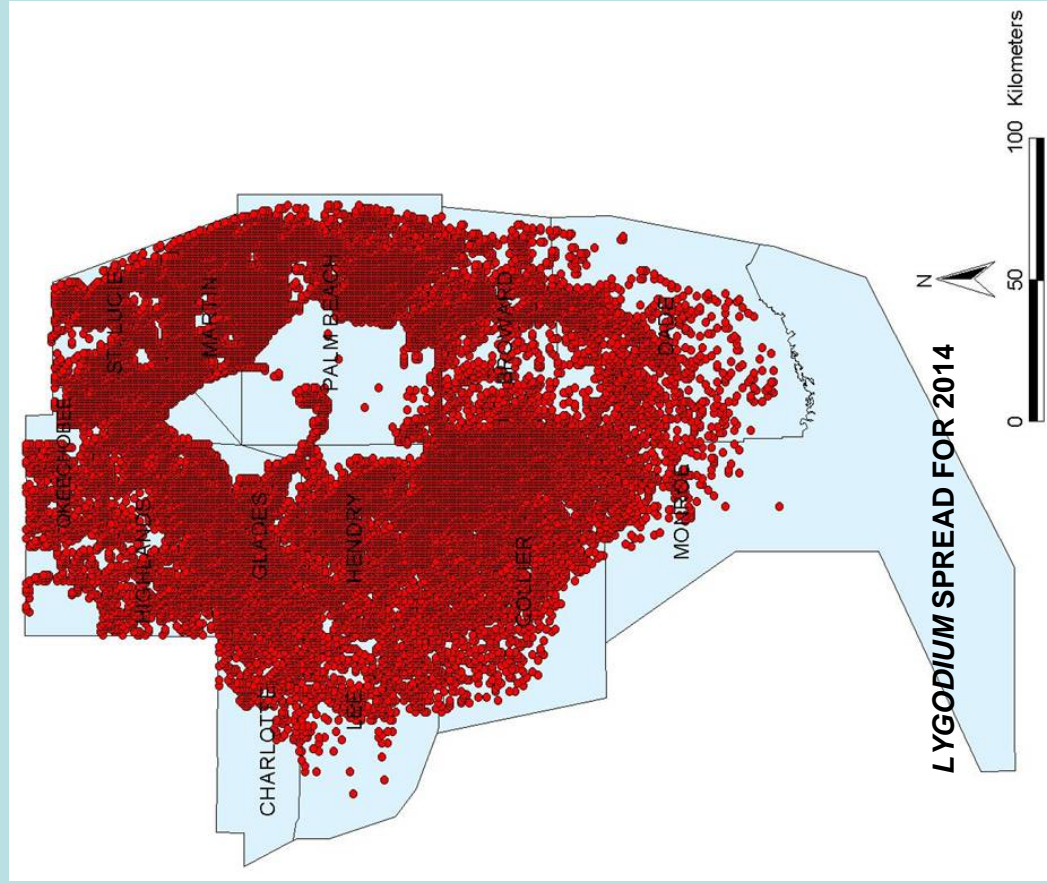
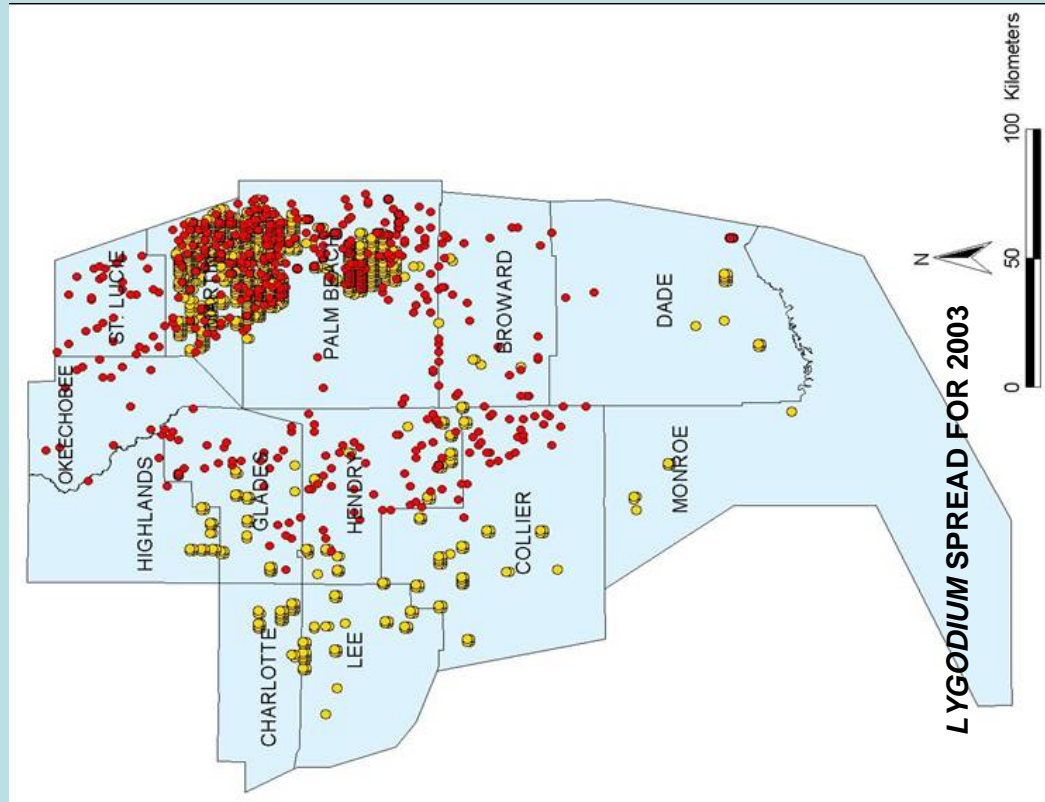
Future Without Project Conditions

Geographic Range Expansion (in acres) with predictions of future spread.

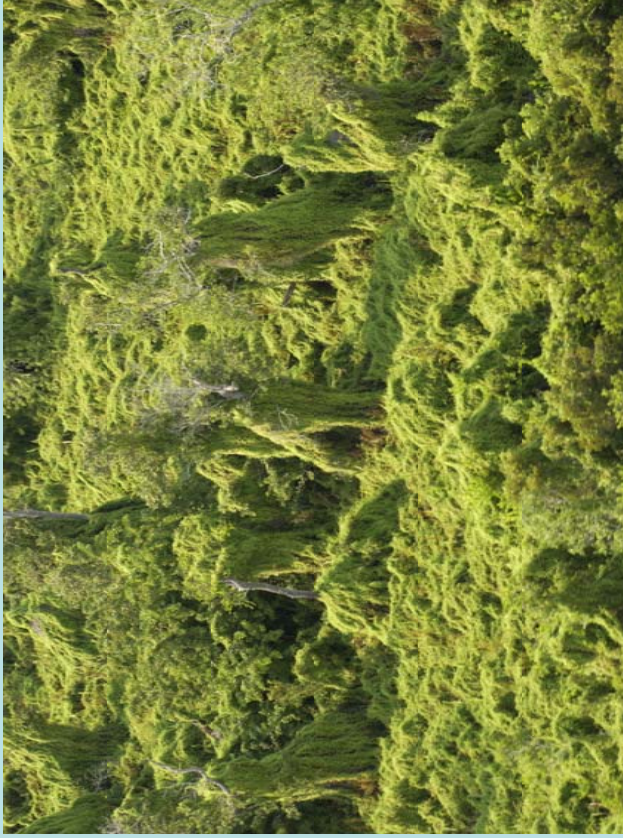
	1993	1995	1997	2003	2025	2050
Melaleuca	488,000	464,000	391,000	329,000	50,000	50,000
Lygodium	28,152	29,970	34,034	120,780	~900,000	~2,700,000
Brazilian Pepper	547,000	899,000	961,000	1,124,000	2,261,750	3,493,000
Australian Pine	344,000	357,000	370,000	385,000	474,000	572,214



Lygodium Expansion



Lygodium Impacts



- Altered Structure
- Collapses Trees
- Altered Disturbance Regime



Lygodium Impacts



- Alters structure
- Prevents recruitment
- Impedes water flow
- Resource Competition

Biological Control

Development Process

- **Discovery and identification**
 - Locate target plant natural enemies in native range
- **Approval for importation and study**
 - Review by USDA Technical Advisory Group
 - Permitting in compliance with NEPA (ESA)
- **Quarantine studies**
 - Testing in a secure lab for host specificity
- **Initial field release**
 - Targeted release areas, rely on natural dispersal
- **Monitoring**
 - Biocontrol agents are tracked by state and federal scientists.
 - Releases and results are annually recorded

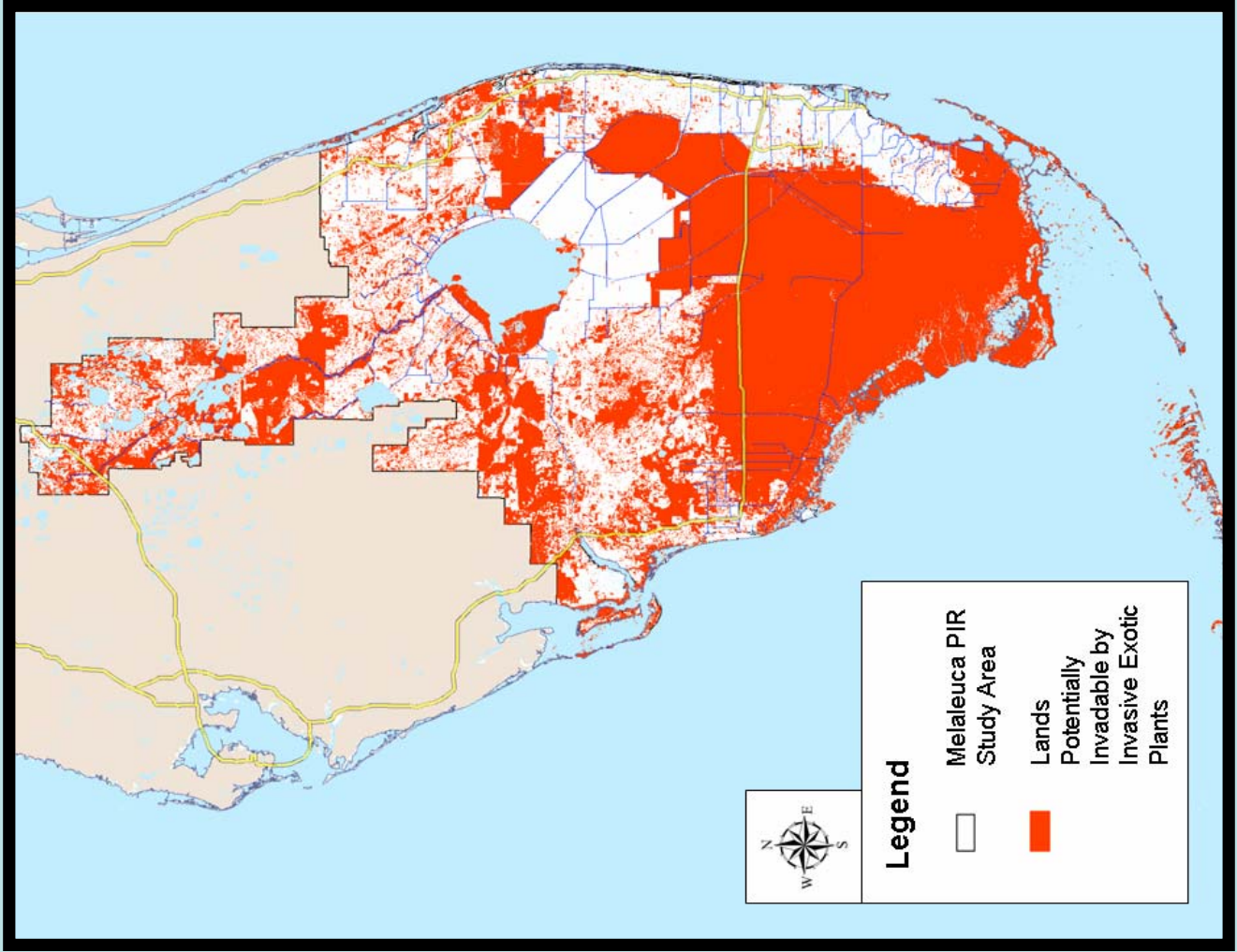
Biological Control Agents

Approval Status

- **Melaleuca**
 - 4 approved
 - 2 approval process
- **Lygodium**
 - 3 approved
 - 1 approval process
- **Brazilian Pepper**
 - 3 approval process
- **Australian Pine**
 - 1 approval process
- **Air Potato**
 - 1 approval process

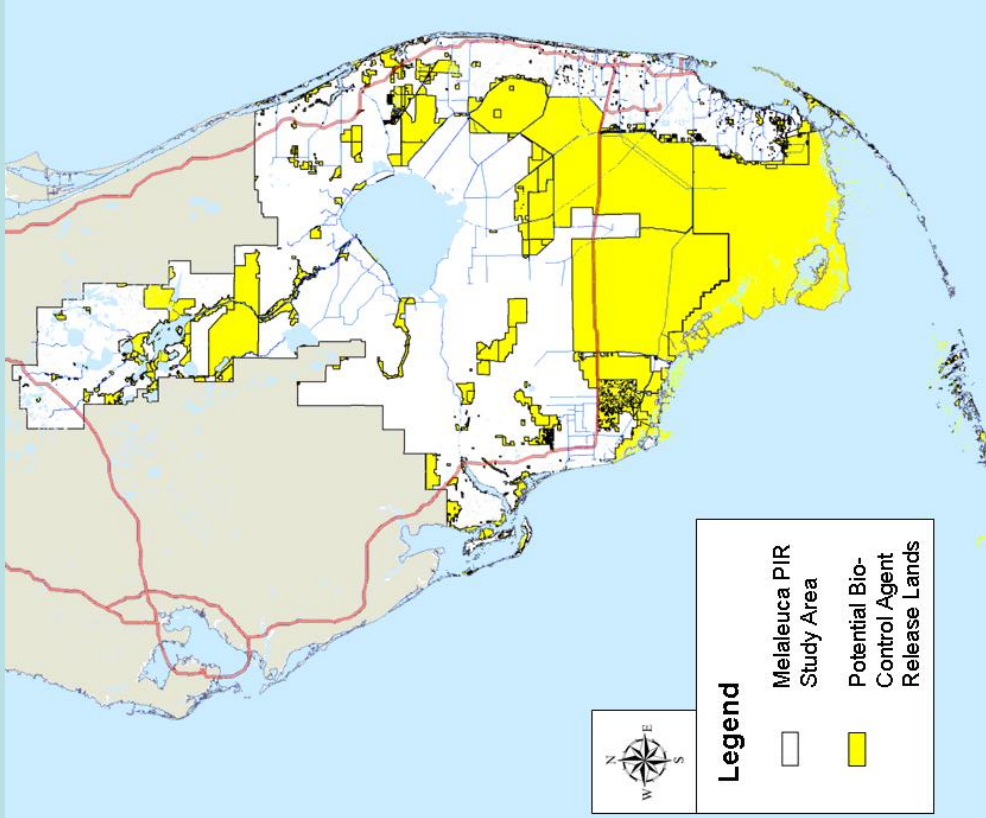


Lands Subject To Invasion



Potential Release Areas

- All target plants are classified Fed/State pest plant lists
- Release only into publicly owned lands
- Will not release onto privately owned lands
 - Private land owners can protect their plants through the use of pesticides





Alternative Plan Formulation

Melaleuca Eradication and Exotic Plants- Implement Biological Controls

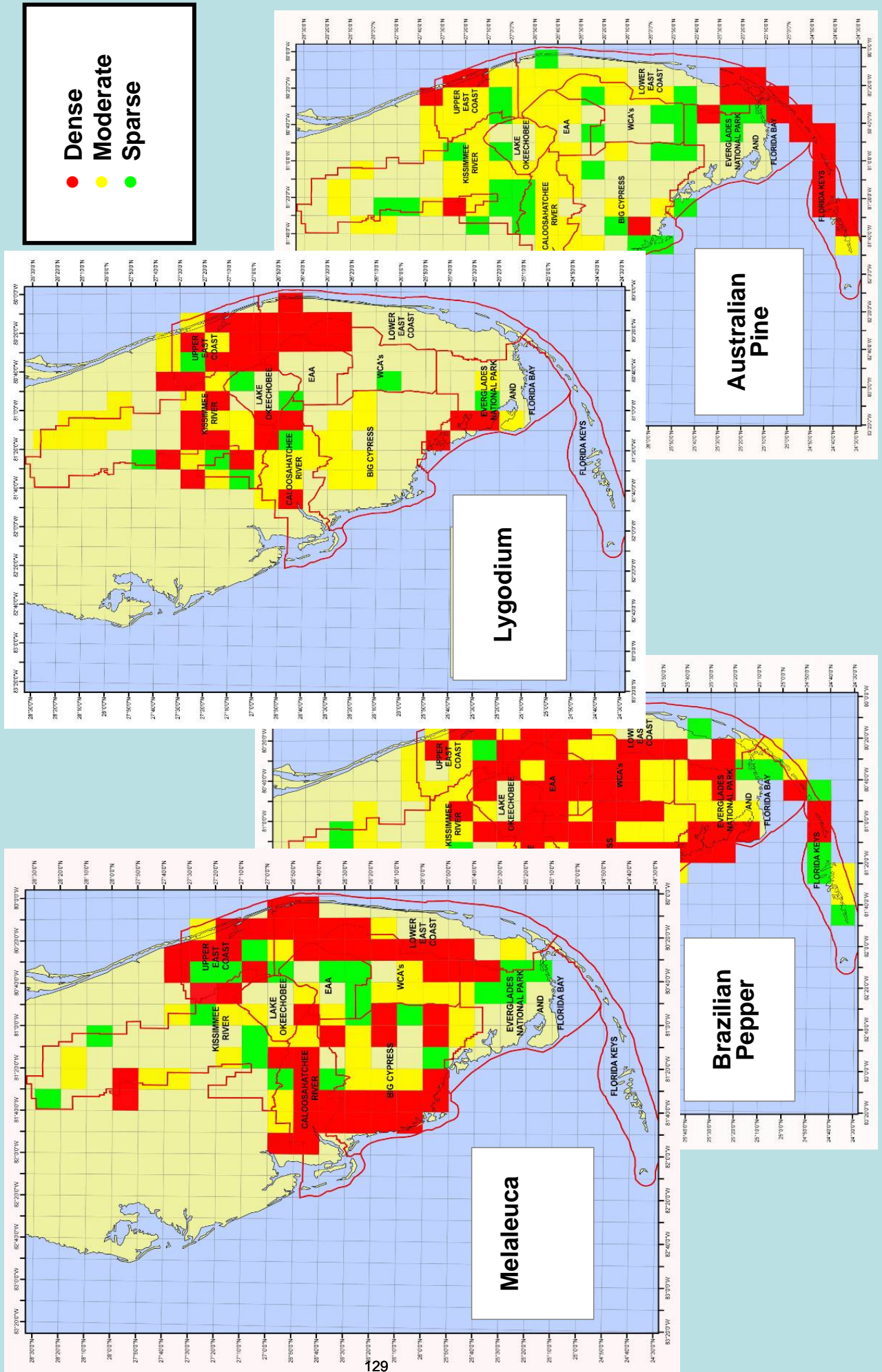
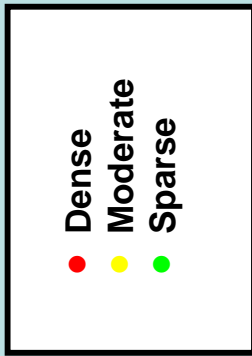
Planning Constraints

- **Biocontrol agents need to be identified and developed over time.**
- **Biocontrol agents are species-specific.**
- **Limits on the number of insects that can be produced at one time.**
- **The effects of all agents are not known.**
- **An ecosystem-level approach must be used to manage exotics species.**

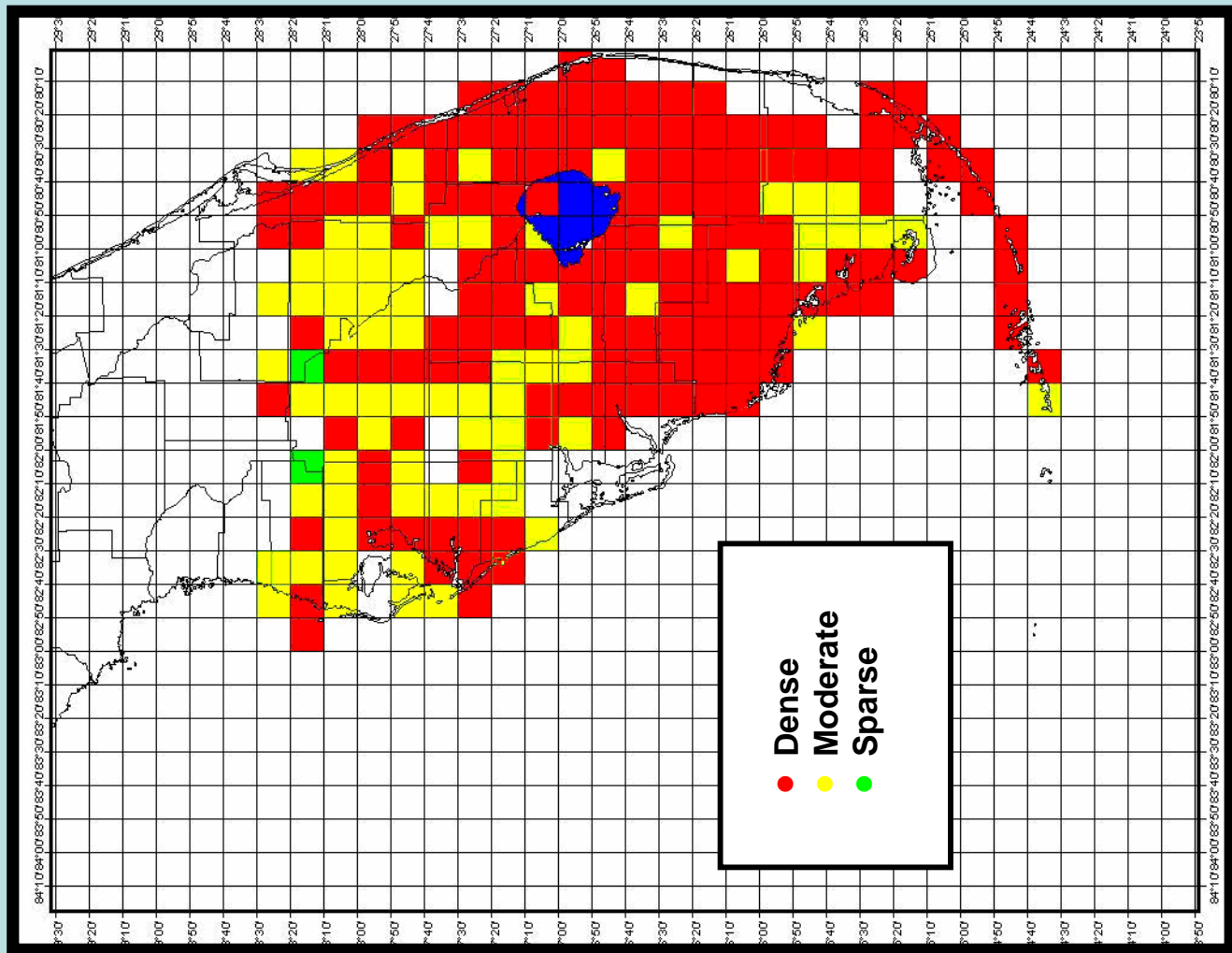
Preliminary Alternative Development

- **Systematic Reconnaissance Flights (SRF) for plant distribution**
- **Preliminary Alternatives**
 - Inoculative Approach
 - Inundative Approach
 - High Density Releases
- **Screening Criteria**
 - Density reduction
 - Seedling mortality
 - Reproductive capacity

Plant Density Estimates

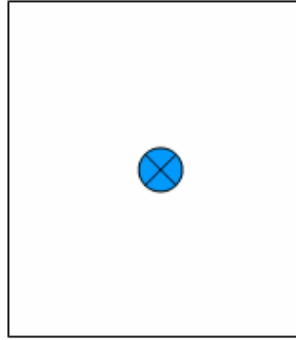


Generalized Density Estimates

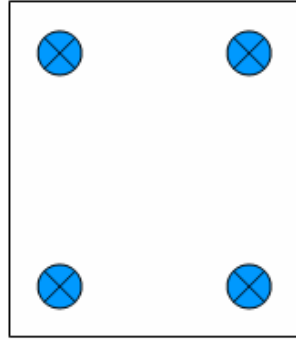


Release Strategies

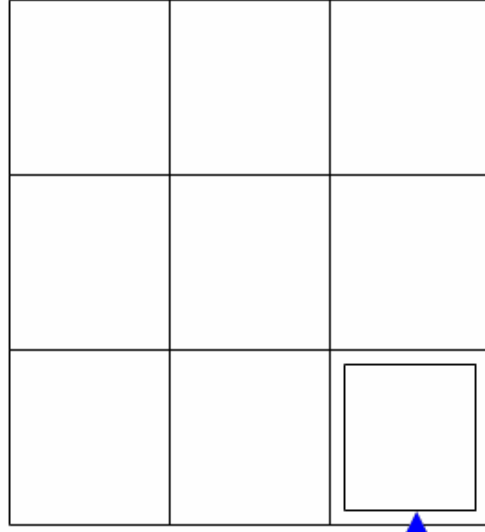
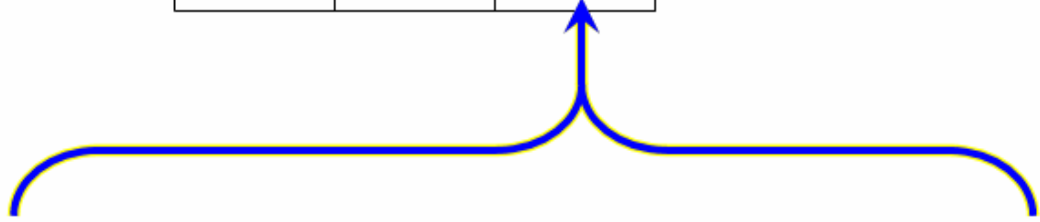
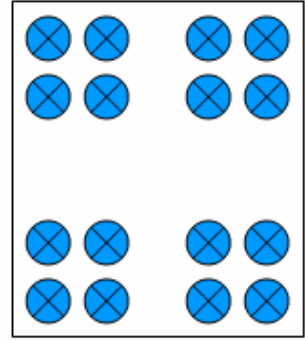
Inoculative Approach - A small number of biological control agents are released at a single site of each cell that is infested with the target weed



Inundative Approach - Multiple releases of a few individual insects in each cell that is infested with the target weed



High Density Approach - Multiple releases of many insects in each cell that is infested with the target weed



Grid cells in Project Area
(showing 9 of the many cells)

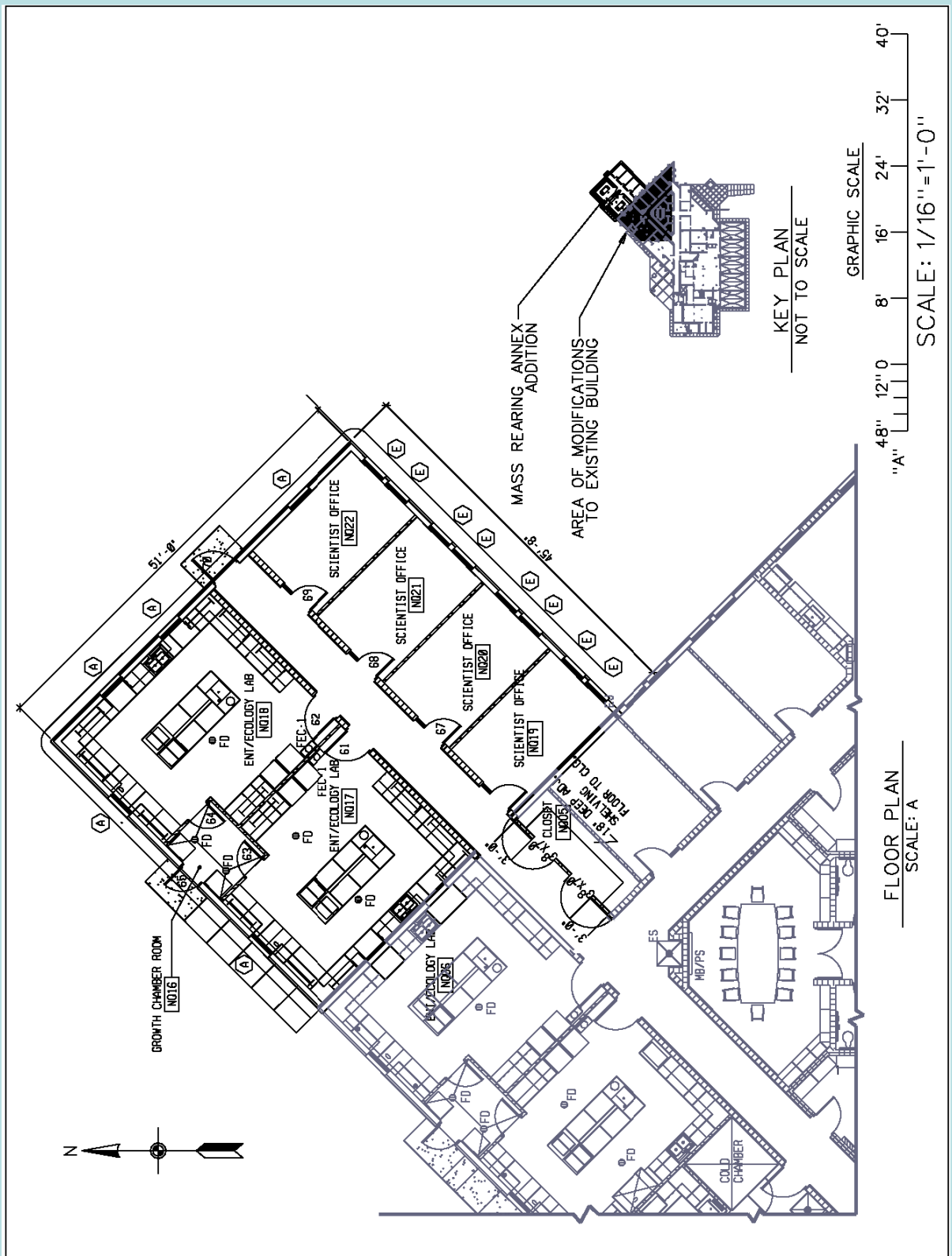


Release Strategy Comparison

Release Type	Number of Insects/ Location	Number of Locations w/in Cell	Amount of Effort	Time to Maximum Weed Impact
Inoculative	Few	One	Little	Long
Inundative	Few	Many	Moderate	Moderate
High Density	Many	Many	High	Little



Mass Rearing Annex



Alternative Plan Screening

- **Eliminate alternatives that target only sparsely infected cells**
 - 6, 7, 14, 21
- **Eliminate alternatives that do not have the mass rearing annex**
 - 2, 4, 8, 10, 12, 15, 17, 19
- **Eliminate alternatives that do not realize benefits in less than 25 years**
 - 13, 20
- **Ranked remaining plans according to times to achieve benefits**
 - In order: 9, 16, 3, 5, 11, 18
 - 11 and 18 were considered marginal and were eliminated from further consideration.

Alternative Plans Matrix

Alternative Plans	Inoculative Release	Inundative Release	High Density Release	Dense Cells	Moderate Cells	All Cells	With Mass Rearing Annex	Without Mass Rearing Annex
1								X
2	X					X		X
3	X					X	X	
4	X			X				X
5	X			X			X	
8		X				X		X
9		X				X	X	
10		X		X				X
11		X		X			X	
12		X			X			X
13		X			X		X	
15			X			X		X
16			X			X	X	
17			X	X				X
18			X	X			X	
19			X		X			X
20			X		X		X	

Initial Screening

Alternative Plans	Inoculative Release	Inundative Release	High Density Release	Dense Cells	Moderate Cells	All Cells	With Mass Rearing Annex	Without Mass Rearing Annex
1								X
2	X					X		X
3	X					X	X	
4	X			X				X
5	X			X			X	
8		X				X		X
9		X				X	X	
10		X		X				X
11		X		X			X	
12		X			X			X
13		X			X		X	
15			X			X		X
16			X			X	X	
17			X	X				X
18			X	X			X	
19			X		X			X
20			X		X		X	

Final Screening

Preliminary Alternatives	Screening Criteria		
	Density Reduction (Years)	Seeding Mortality (Years)	Reproductive Capacity (Years)
1. Do nothing (no releases, future without project)	> 50	> 50	> 50
3. Inoculate all infested cells (red, yellow and green) with approved biocontrol agents and construct a screen house	19	16	14
5. Inoculate only cells with dense weed infestations (red) with approved biocontrol agents and construct a screen house	24	21	19
9. Inundate all weed infested cells (red, yellow and green) with approved biocontrol agents and construct a screen house	13	11	10
11. Inundate only cells with dense infestations of the weed (red) with approved biocontrol agents and construct a screen house	24	22	20
16. Make high density releases of approved biocontrol agents at multiple points in all infested cells (red, yellow and green) and construct a screen house	14	12	11
18. Make high density releases of approved biocontrol agents at multiple points in densely infested cells (red) and construct a screen house	25	22	21

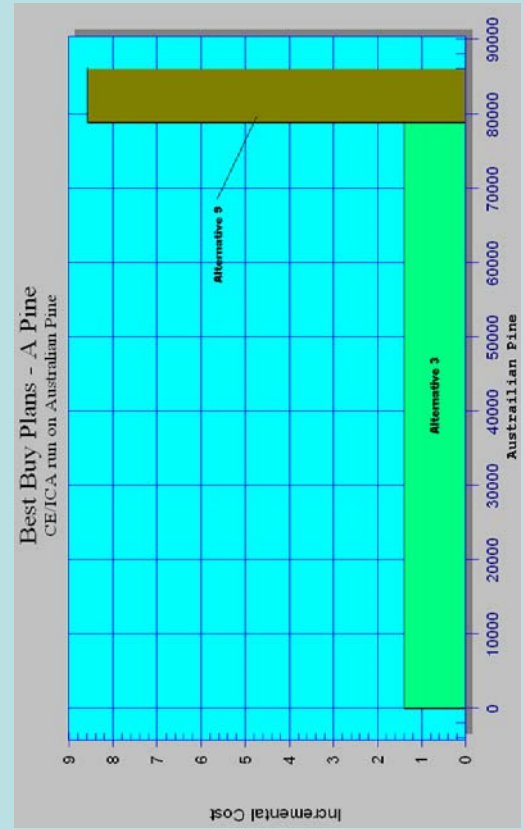
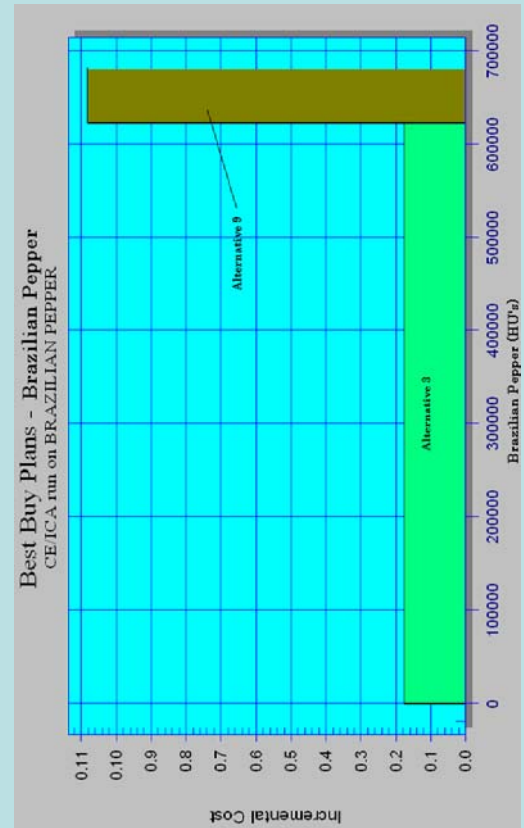
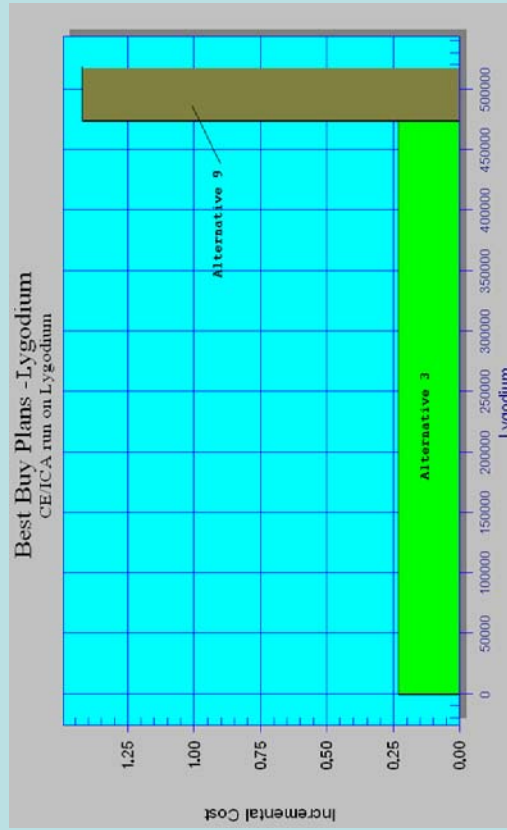
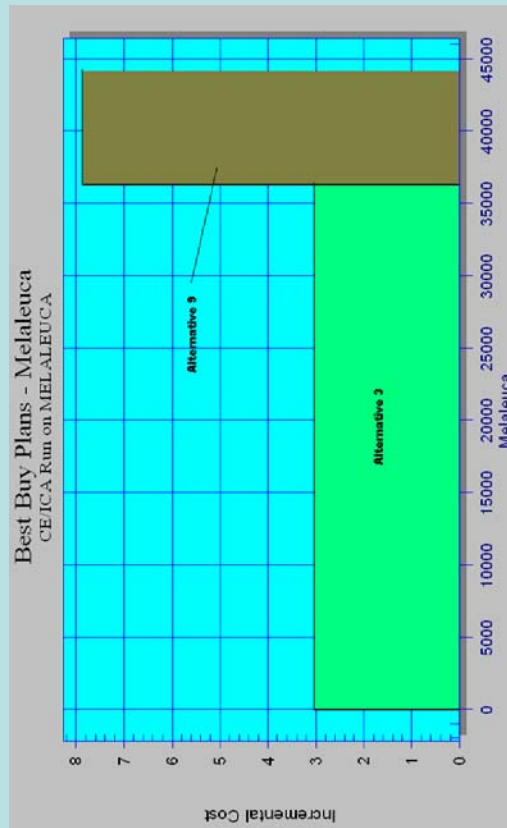
Final Array of Alternatives

- *Alt 3 is identified as the TSP for Melaleuca and Australian Pine
- **Alt 9 is identified as the TSP for Lygodium and Brazilian Pepper

	*Alt 3	Alt 5	**Alt 9	Alt 16
release strategy	inoculate	inoculate	inundate	high density
cells	all	dense	all	all
Melaleuca	351,120	351,120	351,120	351,120
Lygodium	2,158,398	2,027,620	2,315,332	2,289,176
Brazilian Pepper	2,646,599	2,509,444	2,811,185	2,783,754
Australian Pine	435,766	418,952	455,942	452,580
time to full benefits	19 years	24 years	13 years	14 years



CE/ICA Results



Why Alts 3 and 9?

- Achieves project objectives
- Ecosystem level approach
- Protects uninverted lands
- Targeted level of effort
- Increases effectiveness of existing control efforts
- More efficient use of biological agent production capability
- Benefits are independent of other CERP Projects



Why Mass Rearing Annex?

- Achieves project objectives
- Facilitates production of large numbers of biological agents
- Increases benefits in a shorter period
- Cost effective measure



Why now?

Melaleuca is reported to spread at a rate of **7,043 acres/yr**



- Originally released at 13 locations (~ 10 CERP cells)
- Established at 9 sites (~ 8 cells)
- Spread rate of 0.5 mi/yr

- Melaleuca infests 108 of the 11.5 x 11.5 mi grids within CERP boundaries
- At 0.5 mi/yr, Oxyops would take 180 yrs to spread naturally from Fort Lauderdale to Naples
- By inoculating 90% of cells, max dispersal distance would be 23 mi – only 46 yr needed

Costs

- **Total Estimated Cost**
 - Implementation and Monitoring:
 - \$ 12,844,000 (*TSP, May 2007 price level*)
 - Rearing Facility Construction:
 - \$ 787,000 (*TSP, May 2007 price level*)
- **YB Estimated Cost**
 - Construction & O&M
 - \$ 10,800,000 (*October 1999 price from YB*)

Cost Comparison

	Alternative 3	Alternative 5	Alternative 9	Alternative 16
Annual Cost	\$110,000	\$110,000	\$172,000	\$292,000
Melaleuca	36,335	29,775	44,207	42,895
Lygodium	474,066	444,928	517,641	509,726
Brazilian Pepper	623,192	528,623	680,434	670,245
Australian Pine	78,871	73,580	86,089	84,820

Major Milestones

FSM	Oct 2006
AFB Meeting	Aug 2007
AFB Guidance Memorandum	Aug 2007
Selected Alternative Plan (SAP)	Aug 2007
Draft PIR Published in Federal Register	Jan 2008
Final PIR Published in Federal Register	Nov 2008
Initiate Project Cooperation Agreement (PCA)	Mar 2009



14. Adjourn: 3:45 p.m